Incident Report

EUB

ACC Acheson 2-26-52-26
Acheson Field
December 2004 Blowout

EUB Investigation Team Post-Incident Analysis and Recommendations

July 2005

Alberta Energy and Utilities Board

Incident Report

106-00046/

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ALBERTA ENERGY AND UTILITIES BOARD
ACC Acheson 2-26-52-26 Acheson Field December 2004 Blowout—
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ALBERTA ENERGY AND UTILITIES BOARD
Calgary Alberta

ACC ACHESON 2-26-52-26
ACHESON FIELD
DECEMBER 2004 BLOWOUT

EUB INVESTIGATION TEAM POST-INCIDENT
ANALYSIS AND RECOMMENDATIONS

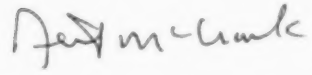
July 2005

DECISION

The Alberta Energy and Utilities Board has considered the findings and recommendations set out in the subject Incident Report. The Board adopts the recommendations. The Board will report at a later date on the implementation of the recommendations.

DATED at Calgary, Alberta, on July 28, 2005.

ALBERTA ENERGY AND UTILITIES BOARD



Neil McCrank, Q.C., P.Eng.
Chairman

Executive Summary

On December 12, 2004, a blowout occurred at the well ACC Acheson 2-26-52-26 (the 2-26 well), located at Legal Subdivision 2-26-52-026W4M in Parkland County, just west of Edmonton city limits (see Figure 3). The well is licensed to 1107882 Alberta Ltd., owned by Acclaim Energy Inc. (Acclaim). The flow from the well was stopped on January 10, 2005, and the Alberta Energy and Utilities Board (EUB/Board) declared the blowout over on January 11, 2005.

On December 12, 2004, routine well-servicing operations were under way on the 2-26 well. During these operations, a downhole explosion occurred, which ruptured the surface and production well casings at a depth of about 18 metres (m), allowing extremely large quantities of salt water, some oil, and sour natural gas to flow to the surface.

The process for the investigation included analysis of reports provided by Acclaim and government responders; the advice of senior advisors, and the knowledge and experience of the investigation team. The process took longer than anticipated because of the amount of time taken to prepare the reports needed for the investigation, the time to analyze the very large amount of information and data, and a broader than usual scope for the investigation.

When the explosion occurred, personnel at the site did not know the size of the emergency planning zone (EPZ) for the well because the calculations for its determination had not been made. This contributed to communication problems between Acclaim and emergency-response providers, the Parkland 911 dispatch operator, the RCMP, and the Enoch Cree Nation police, which ultimately resulted in the unnecessary evacuation of more than 500 people. On the basis of the absolute open flow and H_2S information available when the EPZ should have been calculated, the EPZ was an area having a radius around the well of only 220 m. Since there were no residences within this area, there was no need to evacuate any people. In addition, a more recent gas analysis done after the blowout occurred showed that a lower value for H_2S concentration would have been more appropriate to use, resulting in an EPZ having a radius of only 34 m. Moreover, while it would have been useful to notify people as to the reason for the odour that the release created and that there was no public safety risk involved, H_2S readings taken downwind of the release showed that there was no need to even notify people for public safety reasons, let alone evacuate anyone.

Had Acclaim's on-site personnel known the EPZ, the evacuation likely would have been avoided. The response was overly protective, but public safety was not compromised by the evacuation.

In addition, the EUB should have categorized the incident at Level 3 (the highest level) sooner due to the evacuation. Had this happened, a more coordinated response by Acclaim and the government agencies would have occurred earlier. This would have resulted in clearer and timelier information about the incident and its impacts being communicated to everyone involved, including the public. The EUB elevated the incident to Level 3 early on the second day.

It is important to note that actions taken to secure the immediate area and bring the well under control were generally very good. For example, although some areas were subjected to strong hydrogen sulphide (H_2S) odours during the first few days of the blowout, public safety was never compromised during the incident.

The flow of gas was accidentally ignited on December 13 as crews attempted to stabilize the wellhead. The fire was subsequently extinguished, but the flow was deliberately reignited early on December 16 to allow for safer working conditions at the site and to eliminate odours in the surrounding area.

Because Acclaim could not stop the flow from the well through control measures at surface, it drilled two relief wells adjacent to the 2-26 well. On January 10, 2005, the first relief well intersected the wellbore of the 2-26 well. Drilling mud was pumped into the wellbore, and the flow from the well ceased. Acclaim secured the well the next day, and the EUB declared the blowout over. It had lasted 30 days.

Despite the high profile of the blowout and the impacts to nearby residents, the EUB found that public safety was never compromised during the incident and there have been no lasting environmental impacts from the blowout.

In its news release dated January 13, 2005, the EUB announced that it would investigate the blowout. This report contains the findings and conclusions of the investigation team formed by the EUB and sixteen recommendations made to the EUB's Board for actions to be taken by the EUB, Acclaim, industry, and other government agencies. The EUB's Board has accepted all recommendations made by the investigation and has committed to implementing those that directly relate to the EUB. Some of the investigation team's recommendations follow:

- In accordance with the EUB Generic Enforcement Ladder *(Informational Letter [IL] 99-4: EUB Enforcement Process)*, the EUB issue a Major Level 2 Enforcement Action for contravention of Section 2.1 in *Directive 71, Emergency Preparedness and Response Requirements for the Upstream Petroleum Industry*, which states that a licensee must determine an initial EPZ. Major level enforcement requires a company to take immediate corrective action to address the noncompliance item related to the specific incident, which Acclaim has already done, and ensure compliance at all similar sites in the province. Temporary suspension of certain operations may be necessary to correct deficiencies or alleviate potential impacts. The company must submit a documented action plan within 30 days to the EUB to ensure that the issue does not recur. (Refer to Section 3.)
- The EUB require Acclaim to complete a successful emergency response exercise within six months of the issuance of this report with joint participation from local, provincial, and federal agencies. This exercise should focus on testing communication flow among all emergency responders, include representatives from the public, and be evaluated by the EUB. (Refer to Section 3.)
- The EUB update *Directive 71* to direct licensees to communicate EPZ information to well-site personnel prior to conducting any well servicing on a sour well where a site-specific ERP is not required and consider requiring licensees to notify and advise the EUB of all sour workovers prior to commencing operations. (Refer to Section 3.)
- The EUB coordinate a review (and update if necessary) of the Upstream Petroleum Incident Support Plan (UPISP) to consider municipal, provincial and, where applicable, federal jurisdictional issues, roles and responsibilities, and inconsistencies between emergency response documents. (Refer to Section 4.)
- The EUB place increased emphasis on its effort to enhance its information systems and databases that support its ability to respond to emergencies. (Refer to Section 4.)

- The EUB ensure that there is a sufficient level of coordination and communication among its groups responsible for public safety during an emergency. (Refer to Section 4.)
- Since *Directive 13: Suspension Requirements for Wells* has been in place only as of December 1, 2004, and was implemented after a thorough review of *Interim Directive (ID) 90-4*, the EUB review the effectiveness of *Directive 13* after a further period of experience of one year. (Refer to Appendix 14.)
- The EUB require that the licensees of the wells in the Acheson and Acheson East Fields advise the Board by November 1, 2005, as to how they will meet the requirements of *Guide 10: Guide to Minimum Casing Design Requirements* for the remaining life of the wells. (Refer to Appendix 14.)

The investigation team has made other recommendations that are contained in the body of the report.

1 Introduction

In its news release dated January 13, 2005, the EUB announced that it would investigate the blowout.

A team led by Ed May, of the EUB's Field Surveillance Branch, was formed to investigate the blowout and report back to the EUB's Board. The investigation team considered Acclaim's reports, the information provided by other parties, and EUB staff observations, knowledge, and experience. The team was also assisted by science and technical advisor Dr. David Wilson, P.Eng., University of Alberta engineering professor emeritus, Ray Woods, former energy executive, and Jim Dilay, P.Eng., EUB Board Member.

This report provides the results of the investigation and makes certain recommendations to the Board. The team has attempted to provide a report that will not only allow the Board to discharge its mandate, but also be understandable to a broad range of audiences. Definitions of technical terms are in Appendix 1.

1.1 Scope of the Investigation

In investigating an incident such as a well blowout, the EUB is guided primarily by its Incident Response Reporting Protocol (IRRP), internal EUB guidelines for the investigation, and recommendations that may be made for regulatory change, adoption of best practices, and enforcement action. In accordance with the IRRP, the EUB indicated that it would conduct an investigation focusing on a number of matters directly related to the blowout, including

- what caused the blowout to occur,
- what actions Acclaim initiated to gain control of the well and to mitigate public and environmental impacts,
- how Acclaim, the EUB, and other authorities implemented the Upstream Petroleum Incident Support Plan (UPISP) in response to the blowout, and
- the effectiveness of Acclaim's emergency response plan (ERP) and its implementation, among other matters.

The above constitutes the IRRP matters and is covered in Sections 2 to 6 of this report.

In addition, and in light of the unique circumstances of the Acclaim blowout (including the nature of the well failure and control measures, its duration, proximity to a major centre and populated rural areas, and large-scale evacuation), the EUB decided to include in the investigation some matters not normally covered by the IRRP, including

- the operational and compliance history of Acclaim, and
- the effectiveness of current regulations regarding suspended oil and gas wells.

These matters and other matters not necessarily specific to IRRP follow-up are covered in Section 7 and Appendices 13 and 14.

The investigation team also reviewed all recommendations made by Acclaim in its incident report and responded to them in Appendix 15.

1.2 Process Used for the Investigation

The EUB investigation team, by letter dated January 28, 2005 (see Appendix 2) and in accordance with Section 8.190 (4) of the *Oil and Gas Conservation Regulations*, requested Acclaim to provide a detailed report on the incident. The investigation team recognized that the work that Acclaim needed to do to determine the cause of the blowout and formulate recommendations would take some time. Accordingly, it allowed Acclaim to provide its report in two parts.

Following receipt of the first part of Acclaim's report (which primarily covered basic facts), the investigation team, by letter dated April 6, 2005 (see Appendix 3), asked Acclaim to provide additional information to expand on and clarify certain matters. The second part of Acclaim's report included its analysis of the cause of the blowout and Acclaim's conclusions and recommendations.

The investigation team, by letter dated February 4, 2005 (see Appendix 4), also asked municipal, provincial, and federal departments and agencies, the RCMP, and the Enoch Cree Nation to provide certain information and their recommendations about the response to the blowout and the UPISP. The investigation team received submissions from each of the parties. In some cases, additional information or clarification was requested from some of the parties by letter or verbally.

The investigation took longer than anticipated because of the time required to prepare the reports needed for the investigation, the time to analyze the very large amount of information and data, and the broader than usual scope of the investigation.

2 Site Operations and the Blowout

2.1 Background

The 2-26 well is part of the Acheson D-3A Unit (Unit), comprising 95 wells. Most of these wells are completed in the Leduc Formation at a depth of about 1500 m and are slightly sour (containing H_2S). The 2-26 well had an H_2S concentration of about 225 parts per million (ppm), or 0.0225 per cent, based on a gas analysis done by Acclaim available on January 20, 2005.

Imperial Oil Ltd. drilled the 2-26 well in January 1952. Chevron Canada Resources (Chevron) purchased the Unit assets from Imperial in 1989 and subsequently sold them to Acclaim on June 30, 2004. Acclaim's purchase also included the employment of the Chevron staff responsible for Unit operations. As a result, even though Acclaim had been the owner for only five months when this incident occurred, its staff were very familiar with the Unit.

EUB production data files indicate that the 2-26 well was first brought onto production in January 1962, producing intermittently up until January 2003 from the Leduc D-3A pool.

2.2 The Blowout

The workover on the 2-26 well commenced on November 30, 2004. On December 11, 2004, the rig crew pulled the tubing out of the well. The crew secured the well and equipment for the night. On the morning of December 12 at 8:20 a.m., a rig crew member was opening a valve on the wellhead to take a routine wellhead pressure reading. The pressure was 7000 kilopascals (kPa) (about 1000 pounds per square inch absolute [psia]).

It was at this moment that the downhole casing failure occurred, resulting in the uncontrolled release of gas and well fluids at surface. The rig manager provided the following description of the blowout as it transpired:

> At the time of the blowout…I noticed the ground moving…Dirt and water was flying out of the well…A crater was formed…One minute later… Tubing fell into the hole…The crew all got to the safe area okay…Water, dirt and gas continued to fly out of the hole…

This description indicates that an explosion occurred within the wellbore and that either one or both of the well's production or surface casing strings had failed. Shortly thereafter, the service rig began to lean, resulting in over 150 joints of tubing racked in the rig's derrick (each joint about 10 m in length) falling into a crater that had formed around the 2-26 well.

Acclaim immediately initiated its emergency response, which included a call to the EUB at about 8:35 a.m. (For more information about Acclaim's emergency response actions, please see Section 3.)

An EUB inspector dispatched to the well site arrived at about 10:00 a.m. From December 13 to 24, EUB staff maintained a 24-hour-a-day presence at the well site and a daily presence from December 25 to January 10, 2005, when the well was capped.

2.3 Well Control

During the first two days of the incident, a well control company established a barrier around the wellhead and commenced well control efforts. The large volumes of liquids (primarily salt water, with a small amount of oil) flowing from the well created a large crater around the wellhead. This erosion caused the service rig to topple over, requiring its removal.

The erosion made access to the wellhead a challenge, and fluid control became a priority. Acclaim excavated trenches and pits for fluid diversion and storage in order to improve access to the wellhead. At times, more than 160 tank trucks were used to remove water continuously from the site. (For more information on environmental issues, please see Section 5.)

Despite these conditions, well control specialists believed that they could stop the flow of fluids from the well through surface-kill operations, which involved entering the wellbore through existing surface equipment. If successful, this method of well control would have required considerably less time than drilling a relief well.

At 9:55 p.m. on December 13, about 37 hours after the blowout began, efforts to stabilize the wellhead caused accidental ignition of the gas flowing from the well. Two well control personnel suffered very minor burns.

Acclaim was successful in extinguishing the fire at 7:00 p.m. on December 14. Acclaim then inspected the wellhead to determine if there were any other options for entering the wellbore from surface. The inspection revealed that entering the wellbore through the blowout preventers was likely not possible due to extensive damage from the fire.

On December 15, Acclaim, in consultation with the EUB, decided that the best way to proceed was to reignite the 2-26 well and drill two relief wells (see Figure 1). If the gas was burning, most of the H_2S would be converted to sulphur dioxide (SO_2), providing

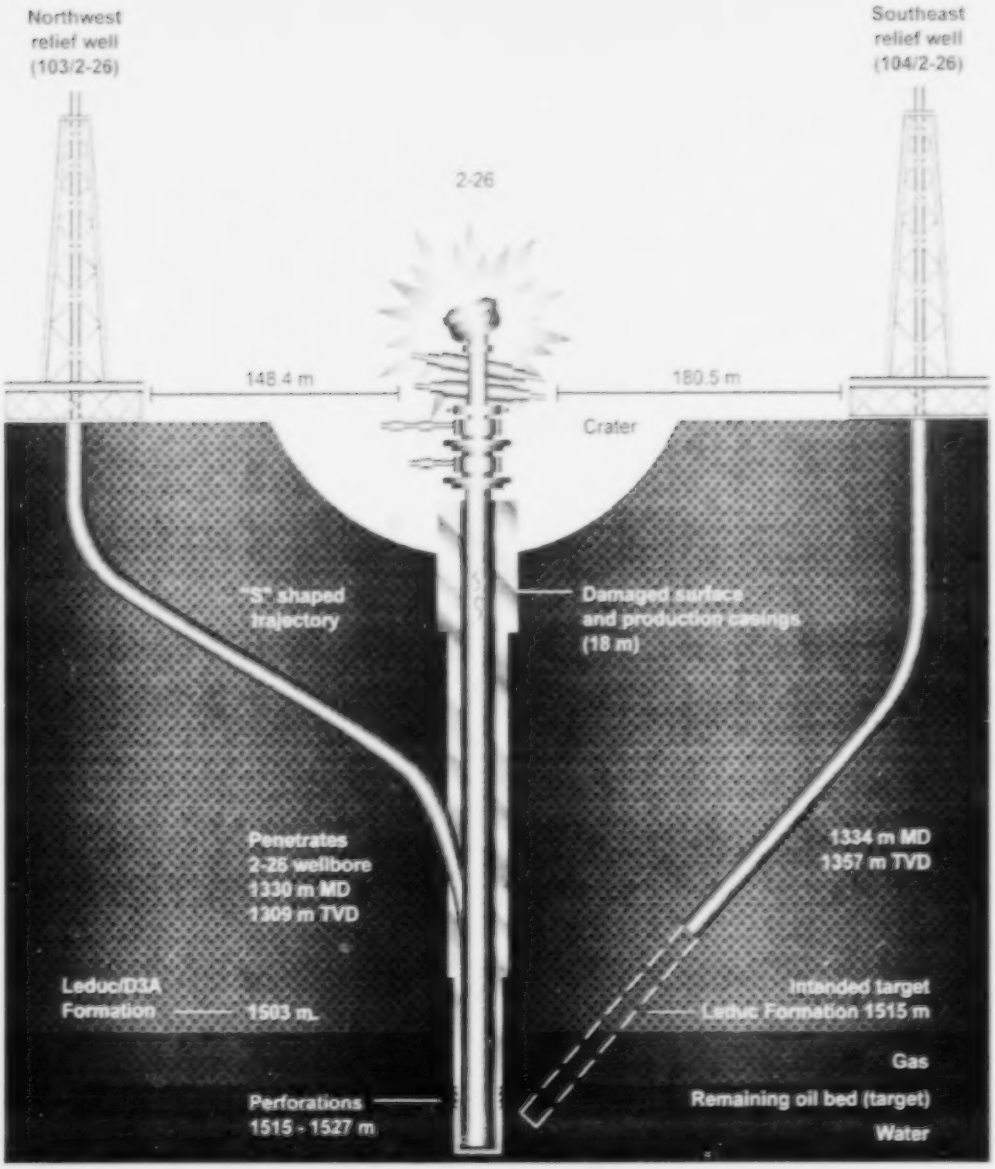


Figure 1. Relief well configurations (adapted from "Diagram of Relief Well Plan" in Appendix 7 of the Acclaim Energy Inc. Acheson 2-26-52-26W4M Well Blowout Report)

worker safety on the lease and eliminating the nuisance odours in the area. Ignition occurred on December 16 at 12:15 a.m.

One relief well at 103/2-26-52-26 W4M (the NW relief well) would be used to intercept and mill into the production casing of the 2-26 well at a depth of about 1300 m. This was a technically challenging operation, as it would require directional drilling technology and the use of magnetic surveys to locate the 2-26 production casing. Once the casing had been penetrated, kill fluids (drilling mud) would be pumped into the 2-26 well to stop the flow. Acclaim brought in additional experts who had previously succeeded using this method.

The other relief well, at the 104/2-26-52-26 W4M location (SE relief well), was targeted to drill into the Leduc Formation in close proximity to where the 2-26 well was completed. Once the target was reached, kill fluids would be pumped into the formation in an attempt to stop the flow. This was a backup operation in case the NW relief well was not successful. Crews began drilling the NW relief well on December 19 and the SE relief well on December 22.

In addition to drilling the relief wells, Acclaim decided to recomplete its nearby 7-26-52-26 W4 (7-26) well, located about 400 m north of the 2-26 well, in the same formation as the 2-26 well. Placing the 7-26 well on production might decrease reservoir pressure on the 2-26 well, which could have reduced flow from the 2-26 well, thereby aiding well control efforts. However, placing the 7-26 well on production had no observable effect on flow from the 2-26 well.

Aside from fluids control, the primary focus for the next several days was removing the surface equipment (pump jack, separator, etc.) at a second suspended well on the 2-26 location, situated about 20 m south of the blowout well. Because the crater around the blowout began encroaching on the second well and the flow of fluids exposed 5 m of its casing, Acclaim abandoned (cemented off) the second well on December 27, preventing any flow from the well should the exposed casing fail.

With the relief wells under way, Acclaim decided to make one more attempt at a surface kill. On December 24, it unsuccessfully attempted to tie into the casing valve on the wellhead and pump drilling mud down the well to stop the flow. After this attempt, Acclaim ceased surface well control efforts, as it was apparent that that approach was futile.

On January 9, 2005, the NW relief well intersected the casing of the 2-26 well at about 1330 m and milling operations to cut into the production casing commenced. On January 10 at 11:30 a.m., the milling operation was successfully completed and drilling mud was immediately pumped through the NW relief well into the 2-26 well. All flow from the 2-26 well ceased.

With the blowout well dead, cement was pumped down the NW relief well into the Leduc Formation of the 2-26 well. The final cement plug was in place at 1:47 p.m. on January 10, and the EUB declared the blowout over on January 11. Drilling operations at the SE relief well ceased, and the well was cased and suspended.

2.4 Root Cause Analysis

In order to determine the cause of the blowout, Acclaim commissioned the following independent experts to examine all evidence gathered from the incident:

- Ludwig and Associates Engineering Ltd. (Ludwig)—examine, test, and conduct failure analysis on the recovered casing, couplings, and tubing retrieved from the blowout well,
- Canspec Group Inc. (Canspec)—examine the sections of casing, couplings, and tubing examined by Ludwig and prepare an independent report as to the cause of the failure, and
- Dynamic Risk Assessment Systems Inc.—conduct a root cause analysis of the well failure.

Based on the information provided, Acclaim determined that the root cause of the blowout was a catastrophic failure of the production and surface casings at a depth of about 18 m from surface, caused by a downhole explosion.

A mixture of air and natural gas and an ignition source were required for this explosion to occur. Acclaim surmised that air was ingested into the wellbore during the previous day's well-servicing operations. Air and hydrocarbon mixtures are created when a well goes on vacuum and air is drawn into the wellbore. During the workover of the 2-26 well, the daily well servicing reports indicated that water was pumped down the production casing at a rate of 0.2 m^3 per minute to hold back formation fluids. However, this rate still allowed air to be drawn into the well because the wellbore was only partially full of water. This set the stage for the explosion. A possible source of ignition was unstable oxidized hydrocarbon products. In rare circumstances, the rapid decomposition of these products, which can occur during a sudden change in pressure (e.g., due to opening a valve), may yield enough energy to create ignition of the volatile mixture of air and hydrocarbons.

At the point where the explosion occurred, the production casing also showed external corrosion. However, corrosion did not contribute to the root cause of the failure. On the basis of the findings of the metallurgical properties and remaining wall thickness of the production casing, Acclaim consultants estimated that the casing was capable of withstanding some 20 000 kPa, more than two times the formation pressure. Although the consultants were unable to estimate the actual pressure resulting from the explosion, they concluded that the pressure had to have exceeded that required to burst the casing. New production casing is capable of withstanding 45 700 kPa. The findings provided by Ludwig and Canspec agreed that there was no evidence that the manufacturing or installation of the casing were contributing factors in its failure.

2.5 Acclaim Revised Operating Procedures to Prevent Downhole Explosions

As a result of the 2-26 blowout, Acclaim recognized that it is necessary to minimize the presence of air in the wellbore. To prevent this situation from recurring, Acclaim developed a revised operating procedure to minimize the presence of air in wellbores and thereby prevent downhole explosions when conducting well servicing operations on wells in the Unit. (For more information about the specific procedures Acclaim has implemented, please see Appendix 5.)

These procedures involve end-of-day operations to remove the contents (air, gas, oil) of the wellbore and replace them with water before securing the well for the night. This requires running in the well with tubing and a packer to isolate the wellbore perforations and then circulating the well over to water.

2.6 Views of the Investigation Team

The investigation team notes that an EUB rig inspection conducted on December 9 by the St. Albert Field Centre confirmed that the rig met all requirements in EUB *Guide 37: Service Rig Inspection Manual.*

The EUB's engineering staff have reviewed and accept the findings of the root cause analysis submitted by Acclaim. The root cause of the 2-26 well blowout was a failure of the production and surface casings caused by a downhole explosion. The explosion was a result of a mixture of air and hydrocarbons igniting in the wellbore. The investigation team is satisfied that the existence of corrosion on the production casing was not the

immediate cause of the blowout, because the burst strength of the casing at the corroded site was capable of withstanding more than twice the reservoir pressure. Although external corrosion was evident at the failure site of the production casing, it did not cause the blowout, and the absence of corrosion would not have prevented the casing failure.

Under certain conditions, a mixture that contains air and hydrocarbons can explode when an ignition source is provided. The oil and gas industry must recognize the inherent risks associated with well servicing operations in which there is potential for air and hydrocarbons to mix. The EUB and the Canadian Petroleum Safety Council (CPSC) can enhance this awareness by issuing safety bulletins. The investigation team believes that this should be done as soon as possible to prevent the recurrence of similar incidents. The EUB has already taken steps to heighten awareness of this matter. EUB field inspectors are currently discussing this matter with licensees during their service rig inspections and will identify this issue in updates to *Guide 37*.

Downhole explosions during well servicing operations are very rare. There were five downhole explosions during well servicing operations in Alberta over the last five years, roughly equivalent to one downhole explosion for every 1.5 million hours of well-servicing operations.

Although the actual source of ignition in the 2-26 wellbore may never be known definitively, it is worth noting that the explosion occurred in conjunction with service rig personnel opening a valve on the wellhead to take a pressure reading.

To minimize the risk of explosions during well drilling and servicing operations and in other oilfield operations, an Industry Recommended Practice, IRP 18: *Explosive Atmospheres in Wellbores, Vessels, Tanks, and Piping Systems* (IRP 18), is currently being developed under the direction of the Drilling and Completions Committee (DACC), a joint industry/government committee established to develop safe, efficient, and environmentally suitable operating practices for the Canadian oil and gas industry in the areas of drilling, completing, and servicing of wells. The primary focus of IRP 18 is to develop recommended practices that will help licensees and contractors work safely in situations to prevent the presence of air-hydrocarbon mixtures, thereby reducing or eliminating explosions.

This project was initiated in January 2003 in response to concerns raised by Alberta Workplace Health and Safety, the EUB, and industry. A draft IRP 18 document is expected by the end of 2005.

With respect to the new operating practices adopted by Acclaim, the investigation team finds that they will help to prevent the development of conditions similar to those that caused the 2-26 well blowout.

Acclaim was clearly willing to consider and act on all reasonable measures necessary to regain well control. For example, it gave serious consideration to the option of relief wells early in the process and drilled two types of relief wells rather than one. Acclaim immediately brought in outside well control experts and worked closely with the EUB to complete this operation. In addition, the recompletion of the 7-26 well was conducted in an effort to reduce reservoir pressure to aid in the well control operations.

Throughout the blowout, Acclaim's primary focus was ensuring public and worker safety. Other objectives included protecting the environment and minimizing resource losses.

The major problem encountered was disposing of the significant volume of salt water and small quantities of emulsified oil. The number of personnel on location dedicated to well control efforts and the close proximity of the well to Edmonton and other nearby populated areas added to the complexity of well control operations. Given the circumstances and logistics of this well control incident, Acclaim did an excellent job of regaining control of the 2-26 well.

2.7 Recommendations to the Board

The investigation team recommends the following:

1) The EUB issue a safety bulletin that identifies the potential hazards associated with air-hydrocarbon mixtures in wellbores and the need to prevent them.

2) The EUB continue to support DACC in the development of IRP 18 until its completion. At completion of IRP 18, the EUB must consider the recommended practices and determine if they are sufficient as a guide for industry and for adoption as regulatory requirements or implement additional regulatory changes if required.

3) The EUB require Acclaim to submit by October 1, 2005, an incident summary review, including its findings and recommendations on how to conduct such operations safely (well servicing operations on wells that are on vacuum), to the CPSC. The EUB anticipates that the Safety Council will issue a provincial safety alert as soon as possible.

3 Acclaim's Notification and Emergency Response

3.1 Background

The primary goal of an ERP is to ensure quick access to critical information necessary to respond effectively to an emergency. Having an ERP in place will ensure that a quick and effective response to emergencies takes place in order to protect the public from fatalities and irreversible health effects. It is the responsibility of the licensee to determine when an ERP is required and the type of ERP required relative to EUB requirements. The EUB has emergency preparedness and response requirements that apply to any hazard associated with upstream petroleum operations *(Directive 71: Emergency Preparedness and Response Requirements for the Upstream Petroleum Industry)*.

Site-specific ERPs are developed for a particular operation/location and must be approved by the EUB. Not all operations require site-specific ERPs. This is only required if a surface development (e.g., residence) is situated within the EPZ. The EUB requires every licensee to have a corporate level ERP. If a licensee is not required to develop a specific ERP for a particular operation/location, the corporate level ERP will address the basic fundamentals of how the company will handle an emergency should an incident occur. *Directive 71* outlines the EUB's requirements for both site-specific and corporate level ERPs.

An EPZ is a priority area (expressed as a distance) surrounding a well, pipeline, or facility where immediate response actions are required in the event of an emergency. This area defines where members of the public may be at risk during the uncontrolled release of a toxic product, such as H_2S. *Directive 71* describes the methodology used to determine an initial EPZ. Once a licensee has calculated the size of the EPZ for its operations, it can determine the appropriate type of ERP required and must then carry out the necessary requirements, as described in *Directive 71*, in developing the ERP. For sour

gas and sour multiphase operations, the type of ERP required is influenced by the presence of surface development within the EPZ. For the purposes of emergency response planning, surface development is defined as occupied permanent or part-time dwellings, publicly used facilities, including campgrounds, and places of business, and any other surface development where the public may gather on a regular basis.

Although licensees are required to calculate the EPZ for sour well servicing operations, *Directive 71* does not require them to communicate the size of the EPZ to on-site personnel if a site-specific ERP is unnecessary. The EUB's Operations Group is currently conducting a full review of *Directive 71* requirements. The review addresses this and includes a comprehensive evaluation of corporate-level ERP requirements.

Acclaim stated that an EPZ had not been calculated prior to servicing operations commencing on the 2-26 well.

3.2 Initial Response and Notification

Immediately after ensuring that all on-site workers had safely evacuated the immediate area near the 2-26 well, Acclaim's on-site supervisor initiated Acclaim's corporate ERP. The supervisor placed calls for assistance at 8:20 a.m. on December 12 to Acclaim's Acheson Gas Plant and informed Acclaim's central district operations engineer, who immediately activated Acclaim's Calgary emergency response centre. The operations engineer then called other Acclaim officials and staff to assist with the emergency.

The on-site supervisor continued with his call-down procedures. He contacted the EUB's St. Albert Field Centre at 8:35 a.m. through its 24-hour emergency response number to report that an underground blowout had occurred at the 2-26 well, gas and dirt were blowing out of a large hole next to the wellhead, and the gas being discharged from the well was sweet (containing no H_2S).

Shortly thereafter, the St. Albert Field Centre called back to discuss the information Acclaim had provided and learned that there were residences close to the 2-26 well. St. Albert classified the incident as a Level 1 emergency, based on the information provided that the release was sweet. The levels of emergency are outlined in Appendix 6.

The information that the release was sweet created some difficulties later during the incident with respect to the implementation of important response procedures involving both Acclaim and the government responders. For more information on this discrepancy, see Section 4.1.1: Classification of the Emergency Level.

After calling the EUB, Acclaim called the Parkland County Emergency Communication Centre (Parkland County 911), the RCMP, and Alberta Environment. Later in the day, it called the following parties:

- Acclaim District Production Manager,
- Acclaim Eastern District Operations Engineer,
- Acclaim Health Safety Environment Manager,
- Alberta Workplace Health & Safety,
- Capital Health Region Authority, and
- City of Edmonton.

Acclaim's corporate ERP states that downwind air quality monitoring must be completed if there is potential for sour gas to be released. Since the well workover plan showed that the well was sour, with a concentration of 300 ppm, Acclaim's on-site personnel conducted a test for H_2S at 9:15 a.m. using a hand-held monitoring unit, according to Acclaim.

The test showed no downwind concentrations of H_2S (wind blowing toward the northeast of well site). (See Section 5.1 for more information regarding air monitoring.) As a precautionary measure, Acclaim's on-site supervisor dispatched someone to notify nearby residents of the blowout and to inform them that an evacuation may be necessary.

Shortly after apparently receiving instruction from Acclaim's on-site personnel to evacuate residents, the Parkland County Fire Department called the Parkland County 911 and asked for RCMP assistance. Parkland County 911 then called Spruce Grove/Stony Plain RCMP and asked them to evacuate the area. During these conversations, the specific limits of the evacuation area to the west were not specified. As a result, RCMP established its own western boundary and evacuated 3.2 km west of Range Road 261 to Highway 60 and 0.8 km south of secondary Highway 628 (see area 1 in Figure 2).

Acclaim stated that when it contacted Parkland County 911, it did not request an evacuation.

Further expansion of the evacuation resulted from a discussion between the RCMP and Enoch Cree Nation police. In the best interest of public safety, they expanded the evacuation area to include 1.6 km south of Highway 628 to 0.8 km east of Highway 60, which included the Enoch Cree Nation community (see area 2 in Figure 2).

This evacuated more than 500 people from the Enoch Cree Nation community, a distance of about 2.5 km at its nearest point to the 2-26 well. In addition, the nearest residents who resided 300-400 m from the well were also evacuated. The evacuation area bordered the western limits of Edmonton.

Figure 3 illustrates the 0.043 km (43 m) EPZ Acclaim calculated when the blowout occurred on the evening of December 12 and the EPZ of 0.22 km (220 m) that should have been calculated based on the information available at that time. (See Appendix 13 for more information on the EPZ.)

All evacuees were asked to leave the area immediately because of the blowout, but were given very little information:

- They were not given specific travel routes to follow to avoid entering the gas plume from 2-26.
- They were directed to find their own accommodations without reporting to a reception centre for registration.
- They were not given any instructions as to who would take care of their needs and expenses.
- They were not informed as to whom they should contact if problems arose, and they did not know who would look after the security of their property, pets, or livestock while they were evacuated.
- Moreover, the parties conducting the evacuations did not prepare a common message or set of instructions to be delivered to the evacuees.

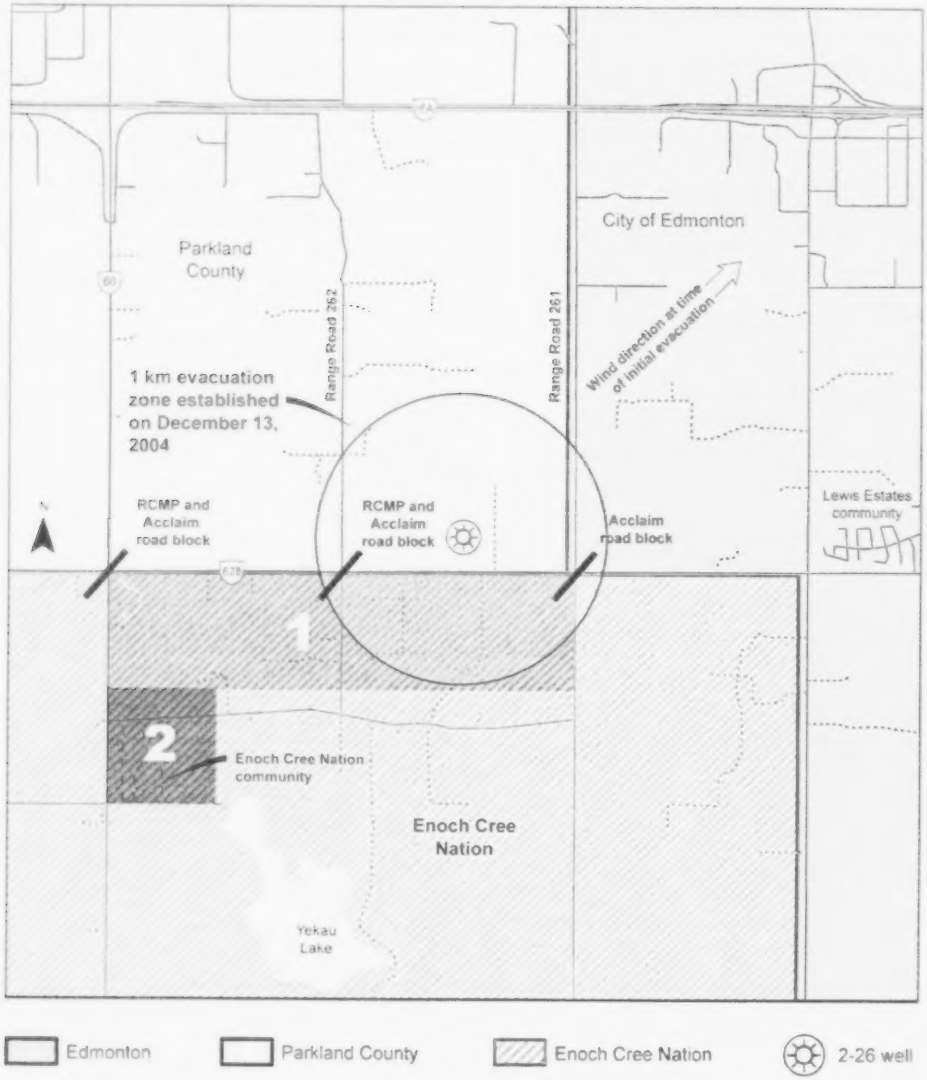


Figure 2. Acclaim blowout: Areas of evacuation

During the incident, none of the below-defined criteria for mandatory ignition as specified in *Directive 71* were met,. As such, ignition was not required.

- Evacuation of the EPZ has not been accomplished.
- Monitoring results indicate H_2S concentrations in excess of 20 ppm (3-minute average) in unevacuated areas.
- Monitored H_2S concentrations exceed 1 ppm (1-hour average) in urban density developments.
- Air quality monitoring is not taking place due to weather or unforeseen circumstances.
- Release cannot be brought under control in the short term (ignition decision will be made in consultation with EUB).

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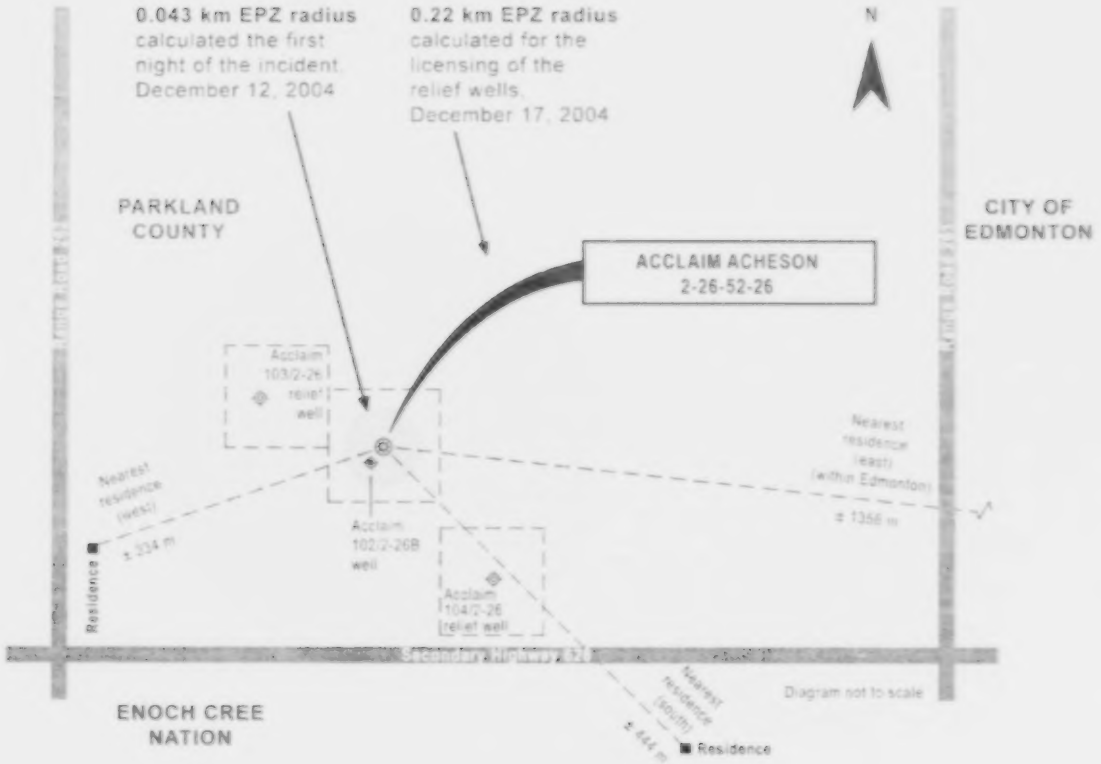

Figure 3. Acclaim blowout: EPZ radiuses of 0.043 km and 0.22 km (adapted from Appendix 45 of the Acclaim Energy Inc. Acheson 2-26-52-26W4M Well Blowout Report)

Acclaim and the EUB did have discussions related to the last criterion; however, it took three days to firmly establish that a surface kill on the 2-26 well was not possible.

Acclaim reignited the well on December 16 to provide for safer working conditions and to eliminate nuisance odours in the area.

3.3 Acclaim's Ongoing Notification and Response

It is important to note that while the 2-26 well is located in Parkland County, it is also less than 0.8 km west of Edmonton's city limits and near the Enoch Cree Nation. As a result, there are county, city, provincial, First Nation, and federal interests.

Acclaim, the EUB, or Emergency Management Alberta (EMA) did not initially notify the City of Edmonton, the Capital Health Region Authority, Enoch Cree Nation, and Health Canada. These parties believed that they should have been notified earlier because people in their jurisdictions were calling to express concern or request information about the incident and their safety.

On day 2 of the incident, Acclaim and the responding government agencies confirmed that there was no immediate risk to public safety and reduced the initial evacuation area to a 1 km radius around the 2-26 well. The reduced evacuation area allowed the majority of the evacuees to return to their homes. Acclaim set up a small restricted-access area around the well site to minimize the impacts from well control operations, such as increased truck traffic, constant noise, and light from the ignited well. Twenty-three people from the nearest residences remained evacuated to avoid these impacts. On January 12, 2005, they were advised that they could return to their homes. Figure 2 also illustrates the 1 km evacuation zone established on December 13.

It took Acclaim several hours to respond appropriately after the evacuations occurred. At that point, Acclaim updated the evacuees about the blowout, took care of their accommodations and subsistence, provided security for their residences with 24-hour manned roadblocks at key points, escorted those evacuees who needed to check on their residences into the area, and monitored for unauthorized entry into the 1 km evacuation area with a dedicated security patrol.

Acclaim stated that it coordinated its emergency response efforts with local, provincial, federal, and First Nations government agencies to ensure that appropriate response actions were implemented in accordance with *Directive 71* and the UPISP.

Acclaim also said that it brought in additional resources as needed throughout the incident, including contract air monitoring experts, professional fire fighters, well control specialists, environment consultants, public/media liaison professionals, and occupational health and safety consultants. Acclaim noted that it was often in contact with so many EUB personnel and departments throughout the incident that it was difficult to determine who the EUB decision-makers were.

Acclaim maintained 24-hour operations at the 2-26 well site and had a staff member present throughout the operations of the Regional Emergency Operations Centre (REOC). See Section 4.3.3 for more information regarding the REOC.

3.4 Views of the Investigation Team

3.4.1 The Initial Emergency Response

The investigation team concurs with Acclaim that the use of its corporate ERP throughout the incident ensured that public safety was maintained while bringing the well under control. Acclaim did a number of very good things during the early stages. It quickly assured the safety of on-site personnel and set up roadblocks to secure the 2-26 well site. It promptly notified nearby residents, advised them of the potential need for evacuation, and then advised the EUB of the incident. Acclaim monitored downwind for H_2S to determine the level of the impact on residents and established local and head office emergency operations centres.

The major shortcoming in Acclaim's performance was that its on-site personnel did not know the size of the EPZ for the 2-26 well. Without a determination of the EPZ for the well, Acclaim could not ascertain whether it needed a site-specific ERP, as required in Section 4.2 of *Directive 71*. However, *Directive 71* does not require a licensee to communicate the size of the EPZ to on-site personnel if a site-specific ERP is not necessary. EUB calculations showed that an acceptable EPZ for the 2-26 well would have been a radius of 220 m, indicating that a site-specific ERP was not required because there were no residences within that distance. Therefore, the use of Acclaim's corporate ERP

to handle the emergency was appropriate. Since the EPZ for the 2-26 well servicing operation was not determined prior to commencing operations, Acclaim's corporate ERP was not implemented properly. This was particularly evident during the very early stages of the incident, when decisions and communications about the appropriate emergency response actions were most important. (For more information about the EUB's EPZ calculation, please see Appendix 13.)

All of the evacuations occurred up-wind from the direction of the gas release; the wind was blowing from southwest to northeast. City of Edmonton residents who were situated downwind were neither notified nor evacuated, nor was this required. The City of Edmonton Emergency Response Department (ERD) dispatch was notified at 10:00 a.m. by Spruce Grove/Stony Plain RCMP about the well blowout, the very low H_2S levels, and the precautionary evacuation of the Enoch Reserve. The ERD received multiple reports of odours, so the Dangerous Goods Team was dispatched to the west end of Edmonton to conduct an air quality test. This test did not detect any dangerous gases (including H_2S), and at 11:45 a.m. the on-duty Fire/Rescue Platoon Chief and Dangerous Goods Team Captain confirmed that the event did not threaten the City of Edmonton.

Though in the interest of public safety, the unnecessary evacuation of over 500 people was not in accordance with the public safety provisions of Acclaim's corporate ERP. The evacuees were unnecessarily inconvenienced, and those in nearby communities likely experienced a heightened sense of anxiety. In fact, one emergency response option to evacuation is sheltering, which should be considered when H_2S releases are causing nuisance odours and are not a threat to public safety. In addition, the evacuation drew media attention that likely unnecessarily alarmed people living in the area and who may have smelled the gas prior to its ignition.

With respect to the option of ignition of the gas flow, the investigation team notes that none of the criteria for mandatory ignition was met. The criteria include that the release will be ignited if control of the well cannot be accomplished in the short term, but "short term" is not defined. The need for ignition was discussed by Acclaim and the EUB during the time taken to assess the feasibility of a surface kill over a period of some three days. Although not necessary for public safety reasons, when the flow was ignited, the odour problem was eliminated and no exceedances of the air quality objectives occurred. The investigation team notes that a comprehensive review of *Directive 71* is under way, which presents an opportunity to clarify the ignition criteria.

Although the investigation team believes that the intent of all of the actions taken by Acclaim and the local, provincial, and federal agencies was to protect public safety, ERPs must be well understood and implemented correctly and effectively in all phases. Failing to do so may compromise public safety.

3.4.2 Communication Problems and Evacuation

Clearly, there is a discrepancy between Acclaim and the local responders as to who initiated the evacuation. Acclaim stated that it did not instruct any local government agency responders to initiate the evacuation, while the Parkland County Fire Department stated that it received instructions to begin the evacuation from Acclaim's on-site personnel. This information was subsequently passed on to the RCMP.

The direct cause of the initial evacuation has not been determined. However, it is clear that there was a lack of understanding between Acclaim and the local government

agencies regarding roles, responsibilities, and the necessary public protection measures to be taken during this emergency.

The investigation team notes that Acclaim stated that it did not establish the 1.6 km evacuation radius and did not order the evacuation, nor was such a radius or evacuation in accordance with any procedures outlined in its corporate ERP. Acclaim also stated that all references in submissions during and after the incident indicating that it had established a 1.6 km evacuation zone were erroneous.

Had the Acclaim corporate ERP been implemented properly, the evacuation would not have occurred, although the nearest residents may have wanted to leave the area due to the odour and disruption created by the well control activities. With proper implementation, better information would have been available sooner to emergency responders and other officials. In turn, they would have been in a position to advise residents in both the local and broader areas that there was only a serious odour problem, not a public safety hazard.

The investigation team believes that the establishment of a 1 km evacuation zone on the second day was a responsible action due to disruptions associated with well control operations but not for public safety needs.

3.4.3 The Corporate ERP

The investigation team reviewed Acclaim's corporate ERP and found that it met most EUB requirements. However, some minor deficiencies were noted in areas such as responder roles and responsibilities, external notification, news releases, and the handling of people with special needs. The investigation team identified additional improvement items that should be addressed by Acclaim to improve or enhance the effectiveness of its ERP. The EUB will follow up with Acclaim regarding these items subsequent to the investigation. The details of the review are included in Appendix 7.

It should be noted that Acclaim submitted a specific sour production facility ERP for its Acheson Operating Area (Edmonton West ERP) to the EUB in November 2004, which the EUB approved in March 2005.

3.5 Recommendations to the Board

The investigation team recommends the following to the EUB Board:

1) In accordance with the EUB Generic Enforcement Ladder *(IL 99-4: EUB Enforcement Process)*, the EUB issue a Major Level 2 Enforcement Action for contravention of Section 2.1 in *Directive 71*, which states that a licensee must determine an initial EPZ. Major level enforcement requires a company to take immediate corrective action to address the noncompliance item and ensure compliance at all similar sites in the province. Temporary suspension of certain operations may be necessary to correct deficiencies or alleviate potential impacts. The company must submit a documented action plan within 30 days to the EUB to ensure that the issue does not recur.

2) The EUB require Acclaim to complete a successful emergency response exercise, within 6 months of the issuance of this report, with joint participation from local, provincial, and federal agencies. The Edmonton West ERP should be used for this exercise. This exercise should focus on testing communication flow among all

emergency responders, include representatives from the public, and be evaluated by the EUB.

3) The EUB update *Directive 71* to direct licensees to communicate EPZ information to well site personnel prior to conducting any well servicing on a sour well if a site-specific ERP is not required and consider requiring licensees to notify and advise the EUB of all sour workovers prior to commencing operations.

4) The EUB require Acclaim to address all deficiencies noted by the EUB with respect to its corporate ERP by not later than October 1, 2005.

4 EUB and Government Emergency Response

In Alberta, the UPISP is used by government agencies when responding to incidents that occur in the oil and gas industry. The UPISP outlines the roles and responsibilities of the upstream licensee and government agencies, including the local authority. Its purposes are to

- ensure effective communication between all government agencies and the licensee,
- make available the appropriate resources to assist in resolution of public concerns, and
- provide assistance and support to the licensee and the local authority in handling the emergency.

It is imperative that the response effort from all government agencies be immediate, well organized, and consistent whenever an incident occurs.

The EUB, as regulator of the upstream petroleum industry and the primary contact for the provincial government, has emergency planning and response requirements for licensees. The EUB oversees response to incidents in the upstream oil and gas industry. It provides direction to licensees during emergencies and investigates these incidents.

In the event of an incident, the EUB requires the licensee of the well or facility to provide a response that ensures public safety. The licensee must activate its site-specific or corporate ERP to initiate public protection measures within its EPZ. The licensee is also responsible for bringing the release under control.

The local authority is responsible for emergency planning and response within its boundaries (according to the *Disaster Services Act*). The local authority will implement its municipal ERP and act as the lead agency in matters affecting public safety within its jurisdiction.

If the local authority does not set up a Municipal Emergency Operations Centre (MEOC) and an operations centre is deemed to be necessary, the district EUB Field Centre will set up a REOC. The purpose of a REOC is to coordinate the response activities within the region of the emergency. The EUB will also send a representative to the On-site Command Post (OSCP) to ensure that operations to control the incident are being handled effectively.

In order to assess the effectiveness of how the EUB and other government agencies implemented the UPISP, the investigation team considered the provisions of the UPISP and compared them to the actions taken by the EUB and other organizations. (For a detailed summary of the findings, please refer to Appendix 8.)

4.1 Emergency Response

The EUB St. Albert Field Centre received the initial call from Acclaim at 8:35 a.m. on December 12 that there was a blowout at the 2-26 well and that the release was sweet (no H_2S). The EUB's on-call person notified the Field Centre's team leader, who dispatched an inspector to the site. The on-call person then contacted the EUB Emergency Response Group (ERG) on-call person located in the EUB's Calgary head office, all in accordance with the EUB's *ERG Procedures Handbook* (an internal EUB document based on the UPISP and used by EUB staff when responding to incidents).

4.1.1 Classification of the Emergency Level

At 9:48 a.m., in consultation with the ERG representative, the St. Albert Field Centre classified the incident as a Level 1 emergency on the basis that Acclaim had reported the release was sweet and, according to the EUB inspector at the site, there was no odour on the lease. Based on that classification and given the proximity of the incident to Edmonton, the EUB initiated a wide calldown to other government responders. (For an explanation of the level of emergency classifications, please refer to Appendix 6.)

At 10:44 a.m., the St. Albert Field Centre updated the ERG on-call staff member but did not advise that there was an evacuation. Although the ERG member was inclined to elevate the level to Level 2 because of the potential for sour gas, the location, and interest in the event, the level was maintained at Level 1 on the basis that the local office was in a better position to assess the appropriate level. A single database is not available to EUB staff to determine whether a well is sweet or sour and, if sour, what the H_2S concentration is.

At 7:15 p.m., the St. Albert Field Centre escalated the incident to Level 2 due to the increasing number of inquiries and considerable media interest. In accordance with the UPISP, the EUB contacted EMA, which is responsible for completing a calldown to other government agencies, including RCMP, regional health authority (Capital Health), local authority (Parkland County), Workplace Health & Safety (WH&S), Alberta Environment (AENV), and other provincial and federal departments as required. EMA failed to implement its calldown when the incident was escalated to a Level 2 emergency.

On December 13, at 10:00 a.m., the EUB escalated the incident to a Level 3 emergency due to the evacuation of residents, the fact that sour gas was being released, and since the incident had gained local and national media attention. The EUB contacted EMA to inform other agencies of the new level and the opening of a REOC. However, EMA decided that another calldown was not necessary, as it believed that all other agencies were aware the incident had been escalated to Level 3. As it turned out, the RCMP was not aware of the escalation.

It is important to note that although the EUB did not declare the incident a Level 3 emergency until December 13, Acclaim stated that from the outset it handled the incident as a Level 3 emergency.

4.1.2 The REOC

During the 2-26 incident, Parkland County decided not to set up a MEOC. The EUB then set up a REOC at the St. Albert Field Centre immediately after it declared the emergency at Level 3.

EMA did not complete a full calldown upon escalation of the incident to Level 3 because it had the impression that the government departments and agencies that were required to be in attendance at the REOC were already aware of the escalation. As a consequence, some of the agencies were not advised of the escalation and the establishment of the REOC. Recognizing that only AENV and Capital Health had sent representatives to attend the REOC, the EUB contacted Alberta Infrastructure and Transportation, WH&S, Parkland County, and EMA. The EUB also contacted the City of Edmonton because of the proximity of the blowout to the city, although the UPISP did not require its attendance. However, the EUB did not contact the RCMP. Acclaim personnel were also present, providing regular updates to other REOC participants, answering public inquiries, and supplying other information when requested.

Although the UPISP requires its attendance and the EUB invited it to attend, the Parkland County did not provide a representative to the REOC. Parkland indicated that it believed that its role was to provide support to the licensee's ERP and that there was no need for it to have a representative at the REOC.

Although WH&S was invited to attend the REOC, it declined and decided to focus on attendance at the 2-26 site to ensure compliance with Occupational Health and Safety code and legislation.

Throughout the incident, the REOC was responsible for managing certain aspects of emergency response, including

- handling of public complaints and inquiries,
- liaising between the OSCP and government agencies,
- enabling immediate and accurate communication between government agencies,
- coordinating responses to media inquiries,
- coordinating and assessing air monitoring activities, and
- tracking evacuees.

The REOC remained open and functioned around the clock for the duration of the incident (30 days). The EUB, AENV, and Capital Health provided staff to the REOC 24 hours a day. Representatives from other government agencies attended REOC meetings when necessary. The REOC was disbanded at noon on January 13, 2005.

4.2 Views of Government Agencies

To fully examine the incident response activities provided by agencies throughout the incident, the investigation team sent a questionnaire to all agencies involved regarding their assessment of the response to the incident. (For the questionnaire and a detailed summary of all responses, please see Appendices 4 and 9.)

Most participants said that the initial information exchange was inadequate. They further stated that it was two to three days before meaningful communications began among all responders. REOC meetings and agendas were late getting initiated, meeting minutes took too long to prepare and distribute, and action items were slow in getting addressed.

4.3 Views of the Investigation Team

4.3.1 Emergency Response

The investigation team agrees that information transfer was inadequate with other government agencies at the beginning of the incident due to the fact that the blowout was classified at Level 1 and that it improved significantly when the REOC was fully functional. Information transfer would also have been better if all required agencies were present at the REOC.

The investigation team also finds that none of these issues resulted in any impacts on public safety. However, improvements to the UPISP must occur, as poor communication or coordination among government agencies could potentially result in reduced public safety during emergency response.

In addition, a coordinated response would likely have prevented the large-scale evacuation that occurred. The investigation team notes that although the evacuation did not compromise public safety, it did unnecessarily inconvenience more than 500 evacuees and heighten concern in the surrounding community.

For example, the UPISP states that the local authority is required to establish an emergency operations centre and to coordinate the establishment and administration of reception centres for evacuees with the licensee. If the Parkland County emergency responders, when speaking with Acclaim, had clarified some of the details about the evacuation (e.g., establishment of an evacuee reception centre) this may have triggered discussion about the need to evacuate in the first place.

The UPISP also indicates that the RCMP should have contacted the EUB before dispatching an officer to the 2-26 site or conducting the evacuation. That communication may have also prevented the large evacuation.

However, the investigation team acknowledges it is possible that neither of these steps would have prevented the evacuation, since Acclaim, the EUB, and Parkland County did not know the size of the EPZ when the blowout occurred.

The UPISP also requires the presence of an EMA representative at a REOC. EMA's participation in the REOC may have improved communication and coordination among the agencies.

Finally, the EUB's mandate to oversee and provide coordination of emergency response is distributed in several groups across the organization. This may have contributed to a number of problems during this incident, including Acclaim's failure to calculate an EPZ, the St. Albert Field Centre not following all emergency response protocols, and other government agencies not fully understanding and fulfilling their obligations under the UPISP. The investigation team believes this matter warrants further review.

The UPISP also states that a debriefing coordinated by EMA between government agencies and the EUB is required after an incident. However, EMA believed that a debriefing was not warranted in this case.

4.3.2 Classification of the Emergency Level

The investigation team is mindful that Acclaim had reported the release as sweet and that the EUB's on-site inspector detected no odours initially. This was perhaps due in part to

confusion as to what constitutes "sour gas" when very low H_2S concentrations are involved. These factors supported the designation of Level 1. At very low levels of H_2S, less than 1 per cent, there exists potential for confusion because there are some differing requirements across the range of regulation of facilities. For example, a well with gas having an H_2S concentration of less than 10 moles per kilomole (less than 1 per cent) is considered a sour well for licensing purposes, but a pipeline to carry gas with H_2S at 10 moles per kilomole or less is licensed as natural gas with H_2S and requires metallurgical properties for sour service. Pipelines to carry gas with H_2S above 10 moles per kilomole is licensed with a substance code of SG (sour gas). Requirements related to emergency response planning do not distinguish between different concentrations but require an emergency response plan at any level of H_2S.

Once the St. Albert Field Centre knew about tubing falling in the crater around the well, the potential for the derrick falling over, the large number of people being evacuated, and interest in the incident by the public and the media, it should have designated the incident at least as Level 2. The investigation team also finds that had the St. Albert Field Centre discussed the emergency level with Acclaim at an early stage, the incident likely would have been escalated to a Level 3 sooner. Had the level been escalated sooner, information exchange between government agencies and government support to Acclaim may have been more effective.

The investigation team also notes that had Acclaim been aware of the EPZ at the time the incident occurred and had it communicated that to the Parkland County Fire Department, the evacuation likely would not have occurred. Had the evacuation not occurred, it is possible that there would have been less interest and concern by the media and the people in the area. With no evacuation and less interest and concern, the emergency level designation would likely have remained at Level 1.

4.3.3 The REOC

Although the UPISP is not clear about when a REOC should be established, the EUB should have set up a REOC when the incident was escalated to a Level 2 emergency, because this would have enabled them to be in a position to coordinate communication, manage air monitoring activities, keep track of evacuees, etc.

The UPISP only requires EMA attendance at the REOC upon EUB request. In this incident, the EUB contacted EMA but did not clearly state that its presence at the REOC was required. As a result, EMA did not provide a representative. The investigation team finds that a representative from EMA should have been at the REOC, because it is one of the key responders during any incident.

The investigation team finds that, although it was not required by the UPISP, the attendance of the City of Edmonton at the REOC was helpful.

The investigation team recognizes that there could be improvements made based on the feedback received from the EUB, Acclaim, and other government responders. (For a summary of this feedback, please refer to Appendix 9.)

4.4 Recommendations to the Board

The investigation team recommends the following:

1) The EUB coordinate a review (and update, if necessary) of the UPISP to consider municipal, provincial, and federal jurisdictional issues, roles, responsibilities, and inconsistencies between emergency response documents.

2) The EUB and other government agencies responsible for incident response conduct training for staff that implement the UPISP and respond to incidents. All responders, including EUB Field Centres and government district offices, must conduct more emergency response exercises with industry on a regular basis, documenting findings and lessons learned, and distribute the results to participants. This would ensure that emergency communications among municipal, provincial, and federal jurisdictions in this area are appropriate.

3) The EUB clarify the present approach to classifying an incident using the EUB risk matrix and ensure its inclusion in all EUB documents and in the UPISP.

4) The EUB place increased emphasis on its effort to enhance its information systems and databases that support its ability to respond to emergencies.

5) The EUB ensure that there is a sufficient level of coordination and communication among its groups responsible for public safety during an emergency.

5 Environmental Impacts

5.1 Acclaim's Air Monitoring and Results

After the blowout occurred on December 12, Acclaim initiated air quality monitoring downwind about 500 m northeast of the 2-26 well along 231 Street, using a four-component hand-held detector. H_2S and lower explosive limit (LEL) readings were recorded beginning at 9:15 a.m. and continuing until the first of three mobile air monitoring units arrived at noon. No H_2S readings were obtained by the hand-held unit, as the off-lease concentration of H_2S was less than 1000 parts per billion (ppb) or 1 part per million (ppm), (the lowest detectable limit of the device), which is at a level where there was negligible risk to public safety.

Acclaim brought in three mobile air monitoring units on December 12, which remained in use until December 29. On December 30, they were replaced by two other units, which were used until control of the well was regained on January 10, 2005.

Acclaim also situated eight stationary air monitoring units at various locations around the 2-26 well on December 15. Six of the units were located in a 0.5-1.0 km radius around the 2-26 well. Two of the units were placed near two local schools, distances of about 3 km northeast and 2.5 km southeast from the 2-26 well respectively.

Data from the stationary monitors were transmitted every 15 minutes to a data centre, which monitored the data 24 hours a day. If levels reached 2000 ppb (2 ppm) of H_2S, the monitor would sound an alarm at the data centre and transmit information every minute until the alarm was resolved. All data were transmitted to the REOC for review.

All of these units were calibrated several times by a third-party contractor during the incident to ensure accuracy. The lower detectable limits of the stationary monitors were

100 parts per billion (ppb) for H_2S and 25 ppb for SO_2. During the incident, the stationary units did not record any H_2S or SO_2.

5.1.2 EUB and AENV Air Monitoring and Results

The EUB's two mobile air monitoring units arrived on site on December 13 at 12 noon and December 14 at 12 noon. Both of these remained in use until January 10. All five of the mobile units (Acclaim's and the EUB's) recorded H_2S, SO_2, wind speed, and wind direction continuously except when calibrating equipment and refueling.

One EUB air monitoring unit was used to track the airborne H_2S and SO_2 plume and reposition the other units as required. This unit was also used to respond to complaints when an air monitoring unit was requested. The unit responded to six complaints: the maximum H_2S concentration of 10 ppb, was measured only once, indicating negligible risk to public safety. The lowest detectable limit of the mobile air monitoring units is 1 ppb. The mobile air monitoring units were repositioned on a regular basis downwind of the 2-26 well, where they would be in the best position to record maximum concentrations.

AENV dispatched its mobile air monitoring laboratory (MAML) on December 13. This unit is capable of monitoring for 13 compounds, including H_2S and SO_2, as well as wind speed and direction, temperature, and relative humidity. Monitoring results for H_2S and SO_2 from the MAML were similar to results obtained by the other units during the incident.

AENV collected data with the MAML and relayed them directly to REOC. It also conducted quality assurance audits on all of the mobile air monitoring units employed. AENV deployed the MAML when it identified specific needs.

Figure 4 shows where one-hour H_2S average readings from mobile air monitoring units occurred relative to the 2-26 well.

5.1.3 Views of the Investigation Team

Air monitoring was appropriate and the investigation team agrees with the results submitted by Acclaim which were consistent with EUB and AENV air monitoring results. Acclaim implemented air quality monitoring in accordance with its corporate ERP and *Directive 71* requirements.

The threshold at which H_2S can be smelled varies between 1 and 30 ppb. The eight-hour occupational exposure level for worker safety in Alberta is 10 000 ppb. During an emergency, the public are required to be notified and evacuated if H_2S concentrations reach the levels shown in Table 1.

The highest instantaneous peak recorded for H_2S was 496 ppb on December 12. The highest one-hour average recorded for H_2S was 70 ppb on December 15. Both of these recordings occurred approximately 500 m east, downwind of the well site. The one-hour average community exposure Alberta Ambient Air Quality Objective (AAAQO) for H_2S is 10 ppb. This concentration is primarily set for odour annoyance purposes, not evacuation. Of the 3055 hours monitored, there were 63 occurrences in total where the one-hour average exceeded 10 ppb, the highest being the 70 ppb previously noted. These levels occurred in the first few days of the incident and were recorded primarily north and east, downwind of the well site. The levels were lower than the H_2S notification and evacuation requirements in Table 1 below.

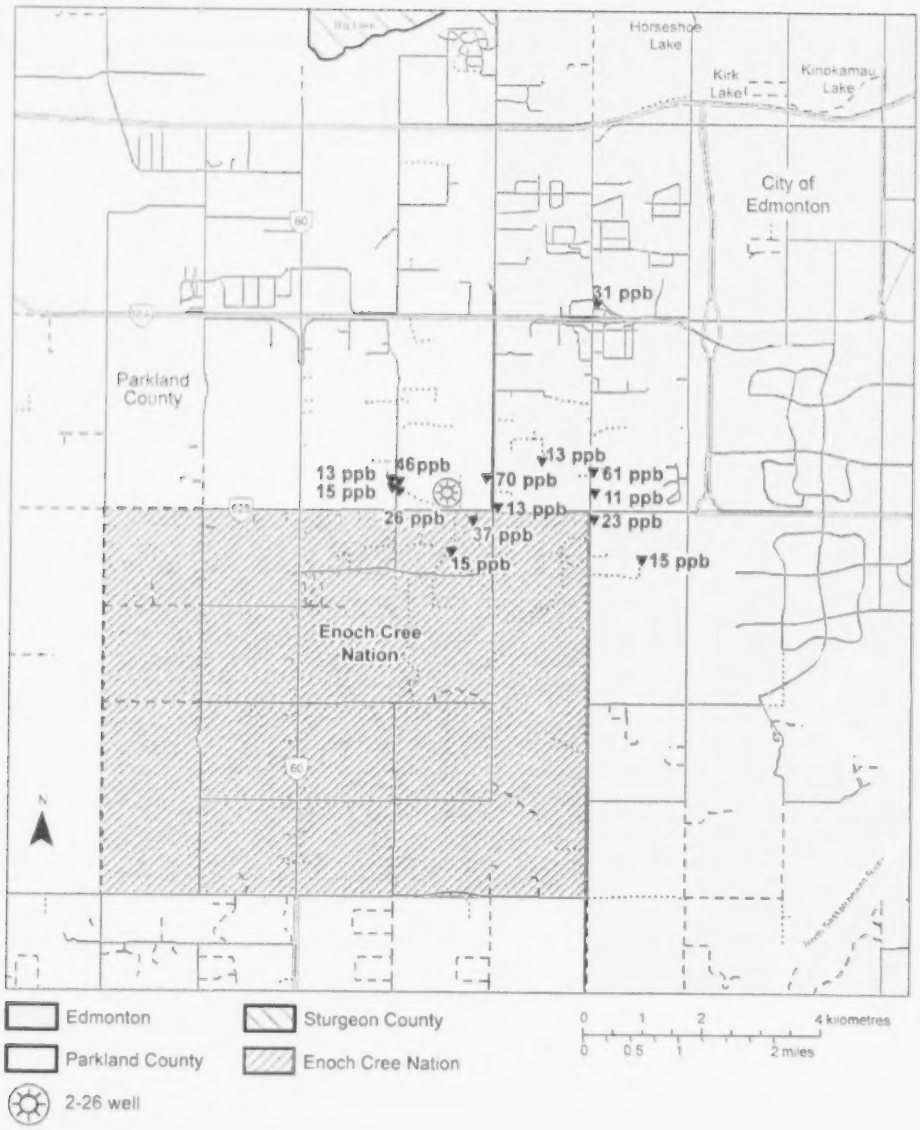

Figure 4. Locations of one-hour H_2S average readings from mobile air monitoring units relative to the 2-26 well

The highest one-hour average recorded for SO_2 was 59 ppb on December 14 which is lower than the one-hour community exposure AAAQO for SO_2 of 170 ppb and the SO_2 evacuation requirement in Table 1.

In summary, the air monitoring results indicate that the H_2S and SO_2 levels recorded during the incident were below the notification and evacuation requirements, as shown in Table 1, and there was negligible risk to public safety.

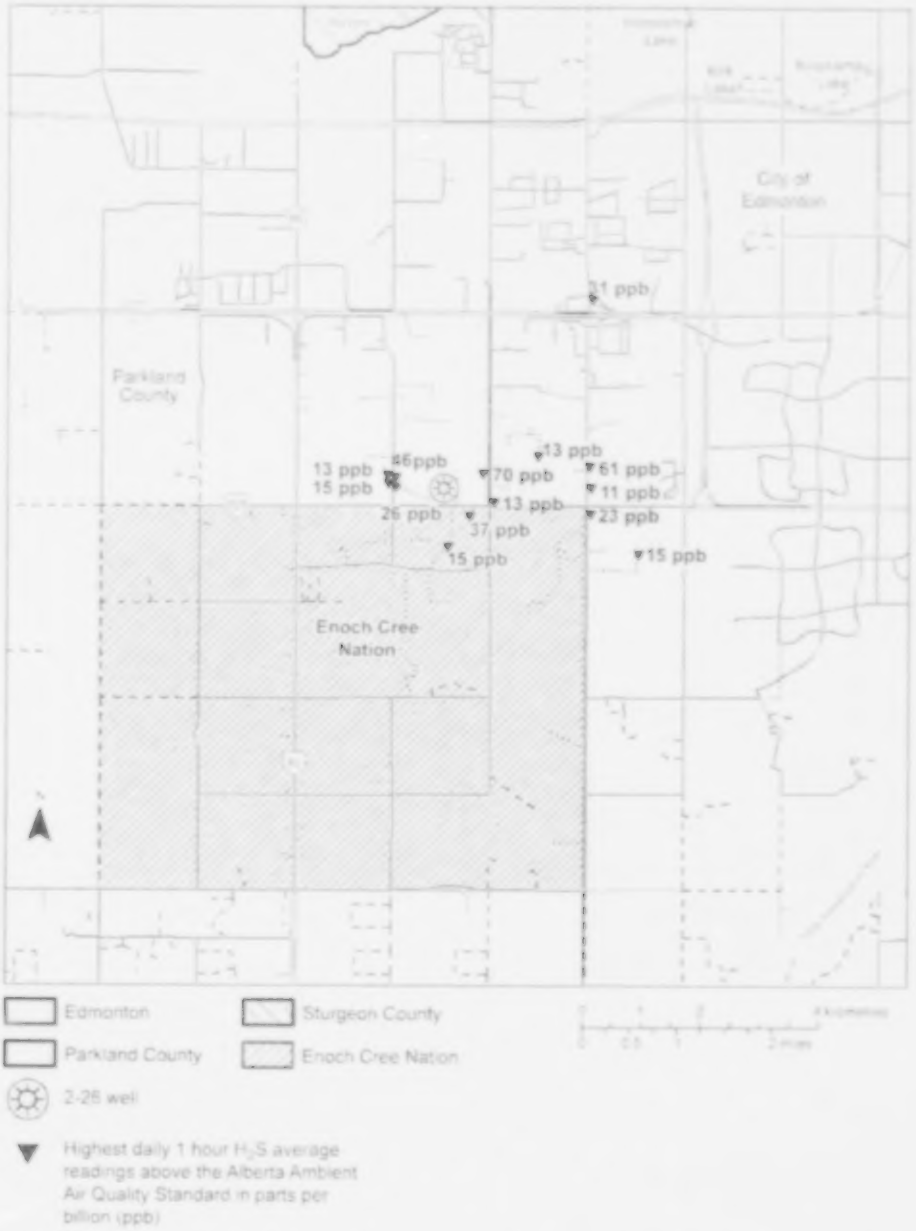

Figure 4. Locations of one-hour H_2S average readings from mobile air monitoring units relative to the 2-26 well

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In summary, the air monitoring results indicate that the H_2S and SO_2 levels recorded during the incident were below the notification and evacuation requirements, as shown in Table 1, and there was negligible risk to public safety.

Table 1. Notification and evacuation requirements outside the EPZ (*Directive 71*, Section 4.3.2, Table 7)

H_2S concentrations in unevacuated Areas	Requirement
1000 ppb (1-hour average)	Notification of hypersusceptibles must begin
Below 10000 ppb (1-hour average)	Hypersusceptible individuals must be informed on the concentrations and advised to leave the area if health symptoms persist or increase. All other individuals should consider leaving the area and seek medical advice if health symptoms develop
Exceeds 10000 ppb (3-minute average) for 8 hours or more	Local conditions must be assessed and all persons may be advised to evacuate
Approaching 20 000 ppb (3-minute average)	Immediate evacuation of the area must take place or the release must be ignited
SO_2 concentrations in unevacuated Areas	**Requirement**
300 ppb (24-hour average)	Immediate evacuation of the area must take place.
1000 ppb (3-hour average)	Immediate evacuation of the area must take place.
5000 ppb (15-minute average)	Immediate evacuation of the area must take place.

At the start of the incident, there were conflicting opinions between EUB and Acclaim as to where the air monitoring units should be located and when they should be moved. It was quickly agreed that the EUB would take the lead role in making these decisions after discussions with Acclaim.

There was also some confusion over which agency should oversee air monitoring activities, the EUB or AENV. However, after discussions between the two agencies, it was quickly decided that the EUB would coordinate these activities. The mobile air monitoring data were not compromised by the initial confusion, but the confusion supports the need to better define the roles of the EUB, AENV, and the licensee.

The investigation team considered the need for conducting air dispersion modelling and decided that it would not be necessary because there had been appropriate air monitoring. However, criteria to determine when air dispersion modelling should be developed for use in future incidents involving sour gas.

5.1.4 Recommendations to the Board

The investigation team recommends the following:

1) The EUB form an EUB/AENV/industry/contractors committee to consider the development of standard operating procedures and protocol to address
   - how instruments are to be calibrated,
   - audits during an incident,
   - standardizing data collection format,
   - criteria for location of monitoring units,
   - collection of meteorological data,
   - criteria for conducting dispersion modelling,
   - coordination of air monitoring units during an incident, and

- criteria required to determine when air dispersion computer modelling should be conducted.

2) The EUB in its review of the UPISP improve the definition and documentation of the role of AENV and the EUB related to coordination of air monitoring during an incident.

5.2 Waste Water Management, Groundwater, and Soil Contamination

The responsibility for the regulation of wastes in Alberta is divided between the EUB and AENV. The EUB is responsible for the regulation of upstream petroleum wastes (oilfield wastes), while AENV is responsible for the regulation of all other wastes generated in Alberta. AENV also develops soil and groundwater remediation objectives, ensures that facility owners and operators decontaminate impacted sites to meet remediation objectives, and develops and maintains surface land reclamation requirements.

For the 2-26 blowout, the EUB was the lead agency responsible for regulating the recovery, storage, and disposal of produced fluids and contaminated soils. AENV was the lead agency on the long-term issues resulting from the incident, including

- remediation of contaminated, unexcavated soil,
- remediation of the 2-26 well site, and
- potential groundwater contamination issues.

The 2-26 blowout was unusual due to the vast quantities of produced fluids flowing to the surface. In order to manage the excessive volume, Acclaim contracted various companies to haul the fluids to approved facilities. At its peak flow, over 160 vacuum trucks were collecting the fluids continuously.

Figure 5 shows a map of the site during well control operations, including the locations of monitoring wells, soil stockpiles, and emergency containment pits and trenches.

5.2.1 Waste Water and Soils Management

Waste water was collected in pits, analyzed, and transported to various waste management facilities, including disposal wells and caverns, in accordance with EUB requirements. As of April 21, 2005, 45 851 m^3 (45 851 000 litres) had been disposed. The remaining approximate volume of 9904 m^3 (9 904 000 litres) at the Acheson Gas Plant 04-02-53-26W4M site will be disposed during the spring and summer of 2005.

Acclaim provided analytical results for the 02-26 site to the EUB for the impacted soils (oilfield waste), the pit walls, and the floor (east, west, and south trenches, well pits, and ramps).

Dewatering wells reduced the water level around the 2-26 well and removed contaminated groundwater. Chloride levels in the dewatering wells were significantly lower than in the produced water. Acclaim plans to conduct an electromagnetic survey to further delineate impacts on groundwater and drill additional monitoring wells if necessary.

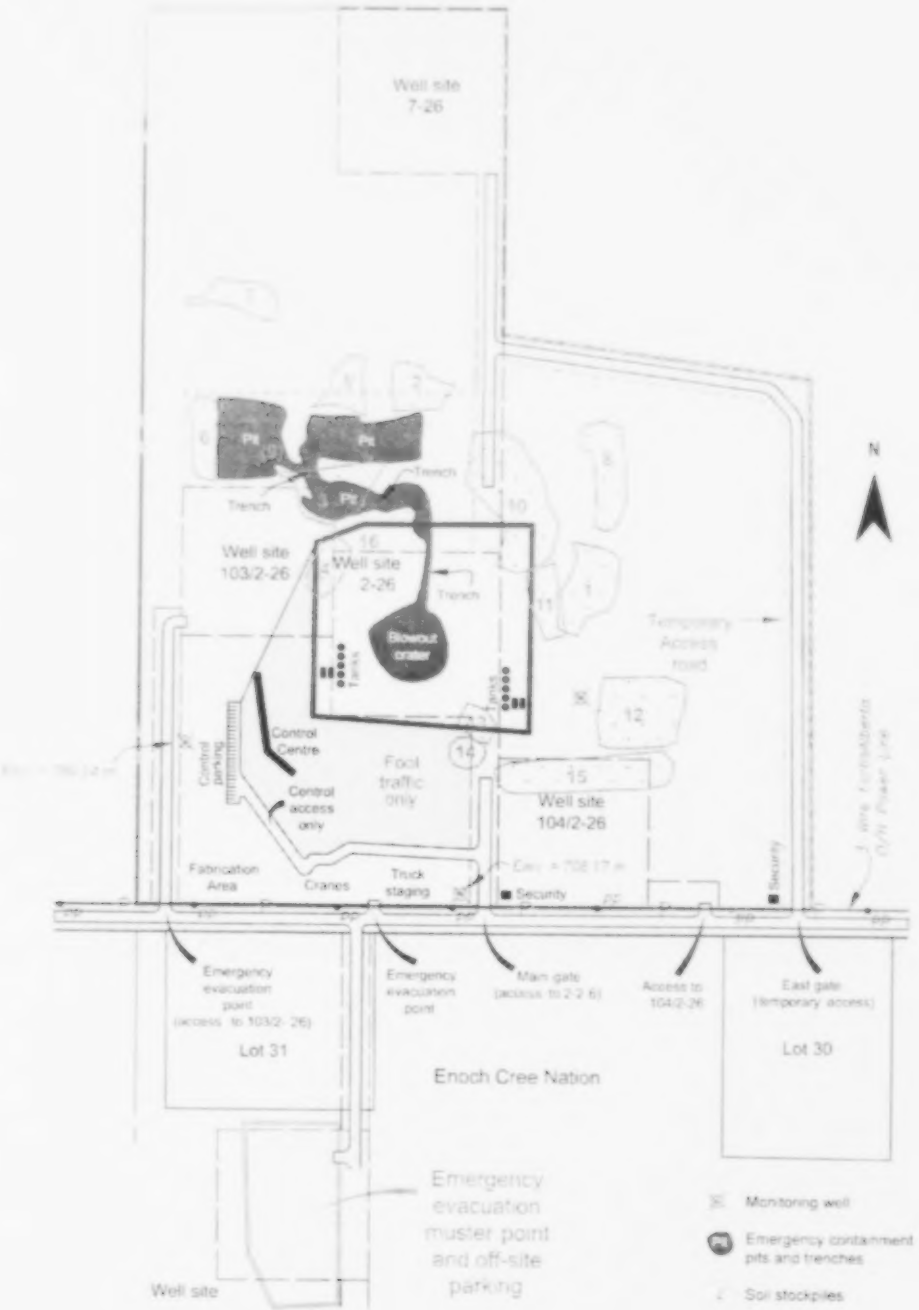


Figure 5. Acclaim blowout: Monitoring wells, soil stockpiles, and emergency containment pits and trenches (adapted from "Area Map Showing Pile Volumes for Acclaim 2-26-52-26W4 within Parkland County," in Appendix 10 of Acclaim Energy Inc. Acheson 2-26-52-26W4M Well Blowout Report)

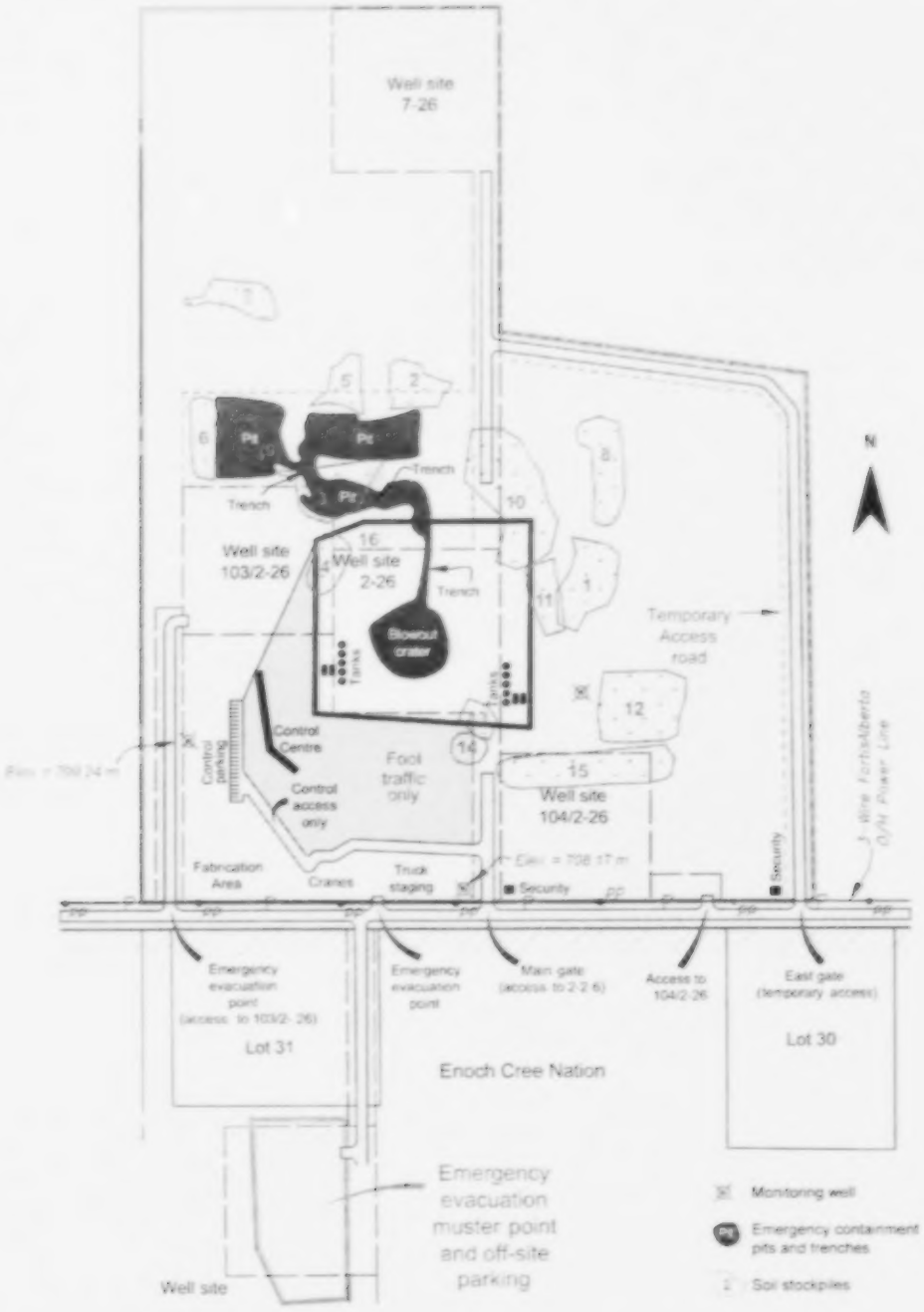


Figure 5. Acclaim blowout: Monitoring wells, soil stockpiles, and emergency containment pits and trenches (adapted from "Area Map Showing Pile Volumes for Acclaim 2-26-52-26W4 within Parkland County," in Appendix 10 of Acclaim Energy Inc. Acheson 2-26-52-26W4M Well Blowout Report)

5.2.2 Groundwater

AENV is the lead regulatory agency for the development and implementation of the groundwater remediation plan. AENV approved Acclaim's groundwater action plan.

Acclaim tested domestic wells within a 2 km radius of the 2-26 well and provided results to water-well owners. No impacts were detected. Acclaim also responded to other water-well concerns, which were found to be unrelated to the blowout.

Acclaim installed three monitoring wells around the 2-26 well on December 23. These wells are being sampled and no contamination has been found to date.

5.2.3 Views of the Investigation Team

The EUB recognized that with respect to handling the massive volumes of salt water and oil emulsion, Acclaim would be unable to meet the EUB requirements for normal operating conditions. The EUB was present on site and was satisfied that the approach that Acclaim was using was acceptable and would result in only short-term impacts that can be remediated. Acclaim has committed to appropriately manage any impacts that occurred during the incident.

Acclaim has developed a management plan for continual interaction and communication between landowners and regulatory agencies (EUB, AENV) during the remediation and reclamation of the site.

Options used for managing the oilfield wastes and the tracking information provided are in accordance with EUB requirements.

5.2.4 Follow-up Action Items

The following action items are required to be completed according to EUB and AENV requirements:

1) The EUB will continue ongoing communication with Acclaim, including on-site inspections, to ensure that remaining oilfield waste management activities are completed in accordance with EUB requirements.

2) Determination of a suitable management option for the remaining oilfield waste at the Acheson 04-02 gas plant and the stockpiled soil at the 02-26 site is under way.

3) The extent of contamination of the storage area at the 04-02 location including floor, ramp, off-loading area, and surrounding land used for the storage of the oilfield waste, will be assessed by Acclaim and results made available to AENV and the EUB.

4) Acclaim must dismantle the 04-02 storage cell and manage all oilfield wastes and impacted soils in accordance with EUB requirements, while AENV is responsible for surface land reclamation.

5) The extent of contamination at the 02-26 location of the fluid containment pits, as well as the stockpile areas, will be assessed by Acclaim and the results made available to AENV, the EUB.

6) Groundwater remediation is within AENV's jurisdiction. The EUB will continue ongoing communications with appropriate AENV representatives throughout the remediation activities.

6 Response to Public and Media Inquiries

6.1 Public Inquiries

The EUB received its first two public calls regarding the blowout on December 12 at 5:50 p.m. and 6:15 p.m. Both of these were related to health concerns. The next day there were nine public inquiries, followed by 23 on December 14 and 14 on December 15. In total, the EUB received 78 calls from the public, of which 58 per cent were complaints and 42 per cent were inquiries for information.

A number of the complaints related to health effects, and many were passed on to Capital Health and/or the callers were advised to contact their doctors. Depending on the nature of the call, the EUB response varied from providing the person with further information over the phone to field inspectors investigating the complaint. It is noteworthy that after the well was ignited, thereby eliminating odours in the local community, the number of calls decreased dramatically.

To ensure that the public was well informed and all complaints had been adequately addressed, the EUB brought in extra staff to initiate a call-back process beginning on December 21. Those who had called the EUB previously were contacted, provided with an update on well control operations, and asked if there were any outstanding issues. If no one was home, a voice-mail message was left with a contact phone number. The call-back process worked very well and was appropriate, considering the duration of the incident and public concern.

After the REOC was activated, the first update was sent out on December 15 at 1:45 a.m. REOC updates were distributed to a wide variety of stakeholders, providing information regarding well control activities, public complaints, environmental status updates, REOC participants' contact information, and air monitoring activities and results. The EUB issued 39 REOC updates over the course of the event. Generally, the REOC handled public complaints and inquiries well. All public complaints and inquiries were tracked through REOC minutes and recorded to ensure completion.

Other complaints and inquiries directed to Acclaim and other government agencies were handled according to their company policies and processes. Acclaim responded to 165 complaints and inquiries.

Between December 16 and 18, Acclaim also delivered 3500 informational letters (its letter-drop program) in a 3-km radius around the well. When the EUB contacted the public as part of its complaint call-back program, the response to Acclaim's letter-drop program was generally favourable. (Please see Appendix 10 for a copy of this letter.)

6.2 Media Inquiries

The initial news release issued by Acclaim on December 12 was consistent with the procedures and guideline statements outlined in its corporate ERP and the guidance provided by EUB Communications staff. Acclaim media releases were also forwarded to the EUB for review prior to distribution. These media releases, 23 in total, consistently indicated that the public was safe.

To assist with media relations and coordinate regular briefings with government representatives, such as the Minister of Energy and the Minister of Health and Wellness, Acclaim contracted a professional communications firm. Acclaim also established a

1-800 number, which was posted on the company's Web site, and the voice messages related to the incident available on the 1-800 number were updated regularly.

Acclaim also scheduled media interviews at the roadblock closest to the site throughout the event and escorted various print and broadcast reporters to a vantage point where they could take pictures and record videos of the blowout.

Between December 12, 2004, and January 13, 2005, the EUB issued six news releases, which were distributed to emergency response agencies and posted on the EUB Web site. Other government agencies also issued news releases throughout the incident.

The first media reports were broadcast the morning of December 12. These reports indicated that hundreds of people had been evacuated from the Enoch Cree Nation community due to toxic gas sweeping over the community. These reports led to considerable concern in the area, including Edmonton, and significantly elevated the profile of the incident.

EUB Communications dispatched a spokesperson to the site on the first day, and media interviews were conducted at the site over the first three days, giving more than 100 interviews with local, regional, and national press. After that, interviews were conducted at the REOC in St. Albert.

Acclaim provided inaccurate data to EUB communications staff regarding the ERP implementation and the size of the EPZ, resulting in the distribution of inaccurate information to the media. The EUB promptly corrected these errors by contacting the media directly. However, inaccuracies such as these can contribute to increased public anxiety and decreased trust in the company, the EUB, and other agencies.

In the first week of the incident, Capital Health posted an advisory on its Web site that was not submitted to the REOC for approval. An inaccuracy in the advisory led to some confusion and inaccurate media coverage.

6.3 Views of the Investigation Team

In key emergency response documents such as the *UPISP*, *Directive 71*, *EUB Media Relations Guidelines*, *Acclaim Blowout Report*, REOC updates and meeting minutes, EUB responder questionnaires, the EUB Contact Summary List, and various media releases, very few standards or requirements exist in the public relations, media response, and communications areas.

Although some recommendations and best practices in this section identify suggestions for improvement in dealing with future incidents, there are many factors and variables that must be considered when determining the best way to communicate during an emergency. Because many of these factors are not measurable (such as the level of concern in a community), guidelines and best practices are more effective than requirements. As a result, proactive assessment of a community's needs during an emergency must remain a priority.

Overall, the investigation team finds that Acclaim, the EUB, and the REOC responded to and handled concerns, complaints, and media inquiries in a satisfactory manner.

Acclaim's efforts to keep the media and public informed were very effective throughout the incident. Quickly distributing a news release and conducting interviews at the site on the first day likely lessened concern in the local community. The company also provided

excellent information on its Web site, established a toll-free number exclusively for the blowout, and conducted a letter-drop to local residents.

Acclaim had an excellent relationship with the Enoch Cree Nation, which began before the incident and was critical in reducing the anxiety and concerns of those affected. The Enoch Cree Nation's leadership appreciated the communication and the relationship with Acclaim.

The EUB has a positive working relationship with the Enoch Cree Nation, developed over several years, which resulted in open communication throughout the blowout.

Acclaim's incident report recommends that companies review EUB news releases in advance during emergency response situations. Although it is the EUB that must decide on the appropriate content of its news releases, the EUB may have the need from time to time to obtain confirmation from the industry of the facts, subject to any securities, proprietary information, or other considerations.

In addition, the EUB should review any news release issued by a company during an event to ensure it contains required and relevant information. If appropriate information is not included in company releases, the EUB can issue its own news release, thereby ensuring that the public receives all relevant data.

The investigation team notes that REOC updates providing the latest information available were also widely distributed during the incident to ensure that all interested parties were well informed.

The EUB and other government agencies used their Web sites effectively to disseminate information, although not all information was provided to the REOC in advance of publication, which created some inaccurate news reports.

The EUB's call-back program was also effective in keeping the local community informed and decreasing public anxiety.

6.4 Recommendations to the Board

Given the unique aspects of emergency response for upstream incidents, no specific recommendations have been made in this section. However, there are best practices and lessons learned that should be considered for future incident response. See Appendix 12 for more details.

7 Acclaim's Operational History

To complete a comprehensive investigation of this incident, the EUB investigation team reviewed Acclaim's operational history. Included in this review was an analysis of

- Acclaim's corporate history,
- the number of wells, facilities, and pipelines Acclaim owns and operates in Alberta,
- the number and results of EUB Field Surveillance inspections conducted on these assets from January 1, 2004, to June 30, 2005, and
- the number of releases and other incidents and their levels of emergency that occurred on these assets from January 1, 2004, to June 30, 2005.

7.1 Corporate History

Acclaim was formed in April 2001 and owns and operates oil and gas properties in Alberta, Saskatchewan, and British Columbia. In Alberta, Acclaim has 1983 operating wells, 440 facilities, and 3344 km of pipelines.

7.2 Acclaim Compliance History (January 1, 2004 – June 30, 2005)

During 2004, the EUB conducted 234 inspections on Acclaim operations. Table 2 shows the results of inspections of Acclaim operations compared to those of industry as a whole. (For results by inspection category, see Appendix 11.)

Table 2. Field Surveillance inspections and compliance rates—Acclaim and industry, January 1 to December 31, 2004

Inspection result	Inspections of Acclaim	Acclaim compliance rate (%)	Inspections of industry	Industry compliance rate (%)
Satisfactory	190	81.2%	11 041	76.6%
Minor unsatisfactory	39	16.7%	3 119	21.6%
Major unsatisfactory	5	2.1%	260	1.8%
Serious unsatisfactory	0	0%	2	0.01%
Total	**234**	**N/A**	**14 422**	**N/A**

A **satisfactory inspection** finds that all regulations and requirements are met.

A **minor unsatisfactory inspection** finds a contravention of regulation(s) and or requirement(s) that does not result in a direct threat to the public and/or the environment and does not adversely affect oil and gas operations (e.g., pipeline signage missing, defaced, or displaying incorrect information; garbage and debris not stored in a reasonable manner at an oil or gas facility).

A **major unsatisfactory inspection** finds a contravention of regulation(s) and/or requirement(s) that an licensee has failed to address and/or has the potential to cause an adverse impact on the public and/or the environment (e.g., failure of blowout prevention equipment on a drilling or service rig, H_2S release causing odours off lease at an oil battery).

A **serious unsatisfactory inspection** finds a total disregard for regulations and/or requirements(s) that is causing or may cause significant impact on the public and/or the environment (e.g., conducting an activity without an approval where an approval is required, unaddressed release into water when the licensee was aware but took no action, blowout prevention equipment missing where required on a drilling or service rig).

The EUB has conducted 97 inspections on Acclaim operations up to June 30, 2005. Table 3 shows the results of inspections of Acclaim operations compared to those of industry as a whole. (For results by inspection category, see Appendix 11.)

Table 3. Field Surveillance inspections and compliance rates—Acclaim and industry, January 1 to June 30, 2005

Inspection result	Inspections of Acclaim	Acclaim compliance rate (%)	Inspections of industry	Industry compliance rate (%)
Satisfactory	80	82.5%	5993	75.3%
Minor unsatisfactory	17	17.5%	1816	22.8%
Major unsatisfactory	0	0%	151	1.9%
Serious unsatisfactory	0	0%	0	0%
Total	**97**	**N/A**	**7960**	**N/A**

Acclaim's compliance performance is typical of industry's compliance performance. Acclaim had no major or serious noncompliance incidents from January 1, 2005, to June 30, 2005. In accordance with the EUB enforcement process detailed in *Information Letter (IL) 99-4: EUB Enforcement Process, Generic Enforcement Ladder, and Field Surveillance Enforcement Ladder*, Acclaim was required to correct the deficiencies found and subject to resulting enforcement actions.

7.3 Acclaim Releases/Incidents (January 1, 2004 – June 30, 2005)

A release is the loss of upstream product (gas or liquid) from its normal containment or transportation device, such as a tank, wellhead, truck, or pipeline.

The EUB classifies releases as incidents based on a criteria matrix found in *Directive 71*. All releases are classified as an alert (Level 0) or one of three emergency levels (see Appendix 6). Releases that can be handled on site through normal operating procedures are typically defined as alerts, while those with more complex resolution are usually defined as emergencies.

Table 4. Acclaim releases, 2004

Total releases 2004	30
Level 0	28
Level 1	1
Level 2	0
Level 3	1

In 2004, Acclaim had two releases that were classified as emergencies. The December 12 blowout was classified as a Level 3 emergency, the most serious level. An incident on September 26 was classified as a Level 1 emergency.

September 26, 2004, Level 1 Emergency

The Level 1 emergency occurred in the St. Albert region. During a routine servicing operation for an oil well, a small amount of sour gas was released. The well flowed 300 ppm sour gas for a few seconds, then stopped. As a precaution, the RCMP was notified. There were no public or environmental impacts as a result of this incident.

Table 5. Releases, January 1 to June 30, 2005

Total releases 2005	17
Level 0	17
Level 1	0
Level 2	0
Level 3	0

In 2005, Acclaim has not had any releases occur over Level 0.

Appendix 1 Definitions

Absolute open flow: The theoretical maximum flow rate from a well when pressures at the wellhead are zero (atmospheric pressure).

Acid stimulation: A technique for increasing the flow of oil from a well by the use of acid pumped down the hole and into the rock formation. The acid dissolves some of the rock, which enlarges the cracks and fissures near the wellbore, allowing more oil to flow.

Blowout preventer (BOP): A casinghead control designed to prevent the uncontrolled flow of fluids from the wellbore by closing around the drill pipe or completely sealing the hole in the absence of drill pipe.

Calibration: Provides the relationship between the concentration of a standard (e.g., a certified test gas) and the output signal of an instrument to be calibrated.

Casing: The steel pipe that is cemented into a well to prevent the wall from caving in and stop unwanted fluids from entering the hole from the surrounding rocks.

Circulation: The movement of drilling fluids through the drill pipe to the bottom of a well and back to the surface to remove drill cuttings.

Corporate emergency response plan: Specific emergency response plans (ERPs) are not required for every drilling, production, or pipeline operation in the province. In these situations the EUB requires a licensee to have preplanned procedures in place (a corporate ERP) that establishes effective response to an emergency.

Dewatering well: A well used to remove free water from a solid substance.

Dispersion modelling: A computerized set of mathematical equations that uses emissions and meteorological information to simulate the behaviour and movement of air pollutants in the atmosphere. The results of a dispersion model are estimated outdoor concentrations of individual air pollutants at specified locations.

Drilling: The act of boring a hole in the earth to find and remove oil and gas. Drilling rigs carry out this work.

Drilling mud: The carrier fluid that is used to lubricate the drill bit, condition the hole to prevent collapse, and transfer drill cuttings to surface when drilling a well.

Emergency planning zone (EPZ): An area surrounding a facility, pipeline, or well where residents or other members of the public may be at highest risk during the early stages of an uncontrolled release of toxic materials such as H_2S or explosion or fire and the area for which the licensee must have a specific emergency response plan.

Emergency response plan (ERP): A comprehensive plan to protect the public, including criteria for assessing an emergency situation and procedures for mobilizing response personnel and agencies and establishing communications and coordination, that is to be followed by all parties in the event of an incident.

Emulsion: A mixture of two liquids that are not miscible, e.g., oil and water.

Gas facilities: Buildings, equipment, and/or structures used in recovery, production, processing, and disposal from gas producing wells. Examples of gas facilities are gas processing plants, gas batteries, compressors, and injection and disposal facilities.

Groundwater remediation: Activities that address issues of contaminant concentrations in groundwater at a site.

Hypersusceptible: Persons who may be abnormally reactive to a given exposure to toxins and whose reaction may occur in orders of magnitude greater than that of the susceptible population. Hypersusceptibles include those persons with impaired respiratory function, heart disease, liver disease, neurological disorders, eye disorders, severe anemia, and suppressed immunological function.

Lower explosive limit (LEL): The lowest concentration of gas or vapour (percentage by volume in air) that burns or explodes if an ignition source is present at ambient temperatures.

Milling: The use of a mill or similar downhole tool to cut and remove material from equipment or tools located in the wellbore. Successful milling operations require appropriate selection of milling tools, fluids, and techniques. The mills, or similar cutting tools, must be compatible with the downhole tools and wellbore conditions. The circulated fluids should be capable of removing the milled material from the wellbore. Finally, the techniques employed should be appropriate to the anticipated conditions and the likely time required to reach the operation objectives.

Oil facilities: Buildings, equipment, and/or structures used in recovery, production, and processing from oil producing wells. Examples of oil facilities are oil batteries and satellites.

Packer: A mechanical device containing a rubber packing element that can be expanded against the wellbore or casing to isolate the sections above and below.

Perforations: Communication tunnels created from the casing or liner into the reservoir formation through which oil or gas is produced. The most common method uses jet perforating guns equipped with shaped explosive charges. Other perforating methods include bullet perforating, abrasive jetting, and high-pressure fluid jetting.

Pipelines: Pipelines transport oil, gas, and/or water from a well or facility.

Recompletion: Redrilling the same wellbore to reach a new reservoir after production from the original reservoir has been abandoned.

Refer status: EUB enforcement action that indicates a company's unwillingness to comply with regulations. The EUB considers this status when deciding to approve or deny future and pending applications by the company.

Release: The loss of upstream product (gas or liquid) from its normal containment or transportation device, such as a tank, wellhead, truck, or pipeline.

Sheltering: Remaining indoors for short-term protection from exposure to toxic gas releases.

Spill: Fluids released that must be recovered and cleaned up according to EUB requirements.

Tubing: Steel pipe hung inside the casing, often only supported by the wellhead. Oil and gas flow to the surface through the tubing.

Well servicing: The work performed on a well after it is successfully drilled. Common well servicing activities include completion of the well to bring it onto production, maintenance (workover) to improve or maintain production, and abandonment when the well is no longer economically viable.

Well site: The parcel of land where oil and gas activities occur, ranging from drilling to abandoning a well. In industry a well site is also referred to as a lease.

Appendix 2 EUB Letter to Acclaim Requesting Incident Report

January 28, 2005

Brent D. Defosse, P.Eng.
Vice President and Chief Operating Officer
Acclaim Energy Inc.
1900, 255 - 5th Avenue SW
Calgary, Alberta
T2P 3G6
Dear Mr. Defossse.

WELL SERVICING - WELL BLOWOUT
1107882 ACC ACHESON 2-26-52-26
WELL ID: 00/02-26-052-26W4/0
LICENSE NO: 0004003
INCIDENT NO: 20042925

On December 12, 2004, Acclaim Energy Inc. (Acclaim) advised the Alberta Energy and Utilities Board (Board/EUB) of a blowout at the subject well. On January 13, 2005, following confirmation that the well was secure, the EUB issued a release that indicated that it was commencing an investigation of the incident. The release noted that the investigation is focusing on a number of matters directly relating to the blowout, including:

- What caused the blowout to occur,
- How Acclaim, the EUB, and all authorities implemented the Upstream Petroleum Incident Support Plan in response to the blowout, and
- The effectiveness of Acclaim's emergency response plan and its implementation, among other matters.

In addition to examining technical matters directly relating to the blowout and the operational history of Acclaim, the investigation is also dealing with the effectiveness of current regulations regarding suspended oil and gas wells. The final report on the investigation will include recommendations on these matters as well as recommendations to avoid similar incidents in the future.

In accordance with Section 8.190 (4) of the Oil and Gas Conservation Regulations, the Board requires Acclaim to provide a detailed report pertaining to this incident by not later than February 28, 2005. The information to be included in the report is documented in the attachment to this letter. In addition to the information listed in the attachment, the Board would appreciate receiving an estimate of the cost to Acclaim to regain control of the well and the cost to implement the emergency response.

The information contained in your report may be the subject of a request for information pursuant to the Freedom of Information and Protection of Privacy Act (FOIP). Please identify those portions of your report which you believe contain confidential information and explain why you believe the information to be confidential.

Acclaim is required to submit an electronic copy to stalbert.fieldcentre@gov.ab.ca and a paper copy of the detailed report to Ken McMorris, St. Albert Field Centre, 30 Sir Winston Churchill Avenue, St. Albert, AB T8N 3A3.

Questions or concerns may be directed to Ken McMorris at (780) 460-3807.

Yours truly,

J.D. Dilay, P.Eng.
Board Member
Alberta Energy and Utilities Board

Pc Dwayne Waisman
Doug Boyler
Ed May
Ken McMorris

ATTACHMENT TO EUB LETTER OF JANUARY 28, 2005 TO ACCLAIM

The following information is required to be included in Acclaim's report to the EUB respecting the well blowout at ACC ACHESON 2-26-52-26 - ID: 00/02-26-052-26W4/0:

1. An executive summary
2. Background to the incident, including:
   - Acclaim's operating history in the area
   - details of any previous nearby similar incidents, if any
   - well history
     - status
     - formation name, depth, pressure, and H_2S concentration (advise if gas analyses is available and the means used to obtain them)
     - well bore integrity inspections (i.e. logs, pressure tests, other), including results
     - well bore integrity studies (both local and Acheson Field) including results
   - summary and assessment of conditions and events that preceded the incident, including preparations relating specifically to handling sour gas and in the case of an uncontrolled release (this must also include how the rig and crew were equipped and prepared)
   - the emergency response plan(s) used to respond to and manage the incident, the methodology used to determine the emergency planning zone, including the gas rate and H_2S concentration used. This description should include the results of H_2S and $S0_2$ dispersion modeling if available and a comparison to actual air monitoring results
   - a copy of the approved workover program and a diagram of the well at the time of the incident showing surface well control equipment and sub-surface completion details (i.e. casing, tubing, packers, cementing, perforations, abandoned intervals, etc.)
   - a copy of or sufficient detail respecting appropriate maintenance and operating programs related to the incident (e.g., tour reports, blowout preventer test and inspection report, employee certifications)
3. With respect to the blowout, describe it in detail including:
   - a general description of the event
   - actual cause(s) and the method used to determine the cause(s)
   - if it has not been possible to determine the cause clearly, your comments respecting what you suspect to be the cause and the basis for your conclusions
   - a description of the well control measures and associated activities taken by Acclaim at the 02/2-26 and 7-26 wells including the use of contractors prior to, during, and subsequent to the incident *
   - security and safety measures for the site and potentially affected area*
   - an estimate of the volumes and flow rates of reservoir fluids released (gas, oil and water)
   - details of air, water, and soils monitoring programs including their results*
   - list of equipment losses
   - communications program and media involvement*
4. With respect to the emergency response to the release, please describe in detail:
   - the implementation of the emergency response plan(s), including internal and external notification, and your comments respecting whether or not the actual actions differed from the actions called for in the plan(s), and if so, the reason(s) for the difference(s)*
   - your comments respecting whether or not the Upstream Petroleum Incident Support Plan was implemented effectively, and if not, how it was ineffective*

5. A description of all potential impacts and steps taken during the incident to monitor and minimize effects on *:

   Public
   - safety
   - health effects
   - evacuations
   - complaints
   - odours

   Environment
   - air
   - soil
   - surface and ground water

   Animals
   - domestic
   - wildlife

6. All third-party analysis/interpretation of failed production and surface casing or other equipment/material failure on the 2-26 and 7-26 wells.

7. Your comments respecting whether or not any EUB regulations were breached, and if so, which regulations and the reason(s) for the breach.

8. Your comments respecting the effectiveness of current regulations regarding suspended oil and gas wells.

9. Conclusions respecting the incident, with emphasis on:
   - how the knowledge gained from this incident will be shared with other operators
   - any plans by Acclaim to present information to the affected public and other interested parties
   - a timeline to implement actions, including measurement points that will be used to ensure actions are followed up, resulting in lasting improvement

10. Recommendations, including:
    - your comments respecting the need to inspect the other wells, facilities, and pipelines in the field to determine their integrity
    - actions to prevent future occurrences
    - any other matters

Where the matters listed above have been marked with an asterisk (*), you are requested to provide the time at which specific actions were taken as well as your comments as to the effectiveness of these actions (what worked well and where improvements need to be made).

Appendix 3 EUB Letter to Acclaim Requesting Additional Information and Clarification

File No. 4010

April 6, 2005

Mark Fitzgerald
Vice President
Acclaim Energy Inc.
1900, 255 – 5 Avenue S.W.
Calgary, AB T2P 3G6

Dear Mr. Fitzgerald:

Re: Well Servicing – Well Blowout
1107882 ACC ACHESON 2-26-52-26
Well ID: 00/02-26-052-26W4/0
Licence No.: 0004003
Incident No.: 20042925

Thank you for the partial report which was received February 28, 2005. The Board requires additional information as indicated in the attachment to this letter. Will you please submit your response on or before April 22, 2005, with an electronic copy being sent to the stalbert.fieldcentre@gov.ab.ca and two paper copies being submitted to Ken McMorris, St. Albert Field Centre, 30 Sir Winston Churchill Avenue, St. Albert, AB T8N 3A3.

If you have any questions or concerns regarding this request please contact Ken McMorris at (780) 460-3807 or Ed May at (403) 297-8132.

Also, as discussed in our telephone conversation, the EUB wishes to meet with you and key staff to review the additional information requested and answer any questions you may have. I will contact you to arrange a mutually convenient time.

Sincerely,

J.D. Dilay, P.Eng.
Board Member
Alberta Energy and Utilities Board

pc: Gene Skappak
Dwayne Waisman
Doug Boyler
Ed May
Ken McMorris

ATTACHMENT TO EUB LETTER OF APRIL 6, 2005 TO ACCLAIM

The following additional information respecting the well blowout at ACC ACHESON 2-26-52-26 – ID: 00/02-26-052-26W4/0 is required:

1. Background to the incident, including:
   - gas analysis from Leduc Formation taken for the 2-26 well or from the 7-26 well, or from another well in close proximity to 2-26 well,
   - if available, Inflow Potential (IFP) test data for the 2-26 well for the Leduc Formation and any projected changes as a result of the miscible flood project,
   - methodology used by Acclaim to estimate the water, oil and gas rates stated in the first report.

2. Activities performed to gain control of the well, including:
   - detailed description of the well control attempts / measures taken throughout the incident, complete with diagrams (i.e. similar to those posted on the Acclaim well site during the incident),*
   - a detailed written statement from the Rig Manager indicating -
     - activities taken immediately prior to, during, and immediately following the blowout occurring,
   - tour reports for the 2-26 (Nabors Rig 94) and 7-26 well workovers and both the relief wells,
   - copy of the detailed rig inspection report conducted by the Rig Manager and Well site Consultant for the 2-26 service rig (Nabors Rig 94),
   - copy of all Acclaim update reports (morning reports),
   - daily summary of Safety Boss activities.

3. Emergency response, including:
   - a detailed written statement from Quinn Fahrenschon indicating:
     - information provided to the 911 operator (County of Parkland) and the response action requested, *
     - instructions given to the RCMP with respect to who should be evacuated, the parameters of the area to be evacuated including who established the 1.6 km. evacuation zone, and the basis for those instructions *
     - the numbers of residents in the area (shown on a map) that Acclaim evacuated and the instructions they were provided with,*
     - instructions provided to other initial responders, *
     - his understanding of initial emergency response expectations, as outlined in Acclaim's Corporate Emergency Response Plan,
     - his review of Acclaim's Corporate Plan with the service rig crew. *
   - a summary of the calculations used to determine the size of the EPZ for the workover / servicing operations at the 00/02-26-52-26W4 well, the chronology as to when the EPZ determination was originally conducted, and whether or not the size of the EPZ for workover / servicing at the 00/02-26-52-26W4 well was known prior to commencement of operations,
   - an explanation of why Acclaim's Corporate ERP was used for the response rather than the draft Acheson Area ERP,
   - an explanation of why Acclaim elected not to declare a Level 3 emergency from the outset of the incident,
   - provide a list of the municipal authorities involved in the Emergency Response Exercise referred to in the December 12, 2005 Post Incident Report,

- a discussion on the implementation and appropriateness of ignition criteria as identified in the Corporate Plan, and whether or not changes should be considered as a result of this incident,
- a "Corporate" statement of the ERP knowledge expected of those charged with implementing the plan, a complete assessment of how each component of the plan was executed, and what can and will be done to facilitate improvements (please discuss site and reservoir knowledge, evacuation instructions, evacuation registration, use of public complaint and notification report forms, establishment of an evacuation center, transient evacuations, consideration for sheltering vs. evacuation, etc.),
- follow-up discussions with respect to emergency response issues, conducted with Acclaim's Daryn Magdall and Darren Jackson, provided the following additional information. Please confirm this information is accurate as recorded:
  - Acclaim's Corporate Emergency Response Plan was the primary document used in the initial response to the incident, and Acclaim's draft Acheson Area ERP was used as a supporting document only.
  - An error was made in the initial calculation of the Emergency Planning Zone for the 100/02-26-052-26W4 well. A decimal place error resulted in a 428m planning zone when it should have been 42.8m.
  - The incorrect 428m zone was supplied to the Well Workover Supervisor at the time of the incident.
  - During the initial stages of the incident, the 428m emergency planning zone for the 100/02-26-052-26W4 well evolved into the very large evacuation zone unintentionally and not by any intentional action by Acclaim.
  - The 220m EPZ, mentioned in the December 17, 2004 e-mail was for the Completion / Servicing of 103/02-26-052-26W4 and 104/02-26-052-26W4 relief wells. The zone was calculated using an offset well H_2S release rate and AOF.
  - Daryn Magdall stated the rig crew called the RCMP, and the RCMP was responsible for the evacuation of all but the closest residents.
  - Acclaim did not keep the evacuation log, and has not received one from the RCMP.
  - The rig crew evacuated residences which were in close proximity to the well.

4. Public Impacts, including:
   - a discussion about the nature of the calls received (165) including a general description of the location of the callers and Acclaim's response to each, *
   - comment as to what follow-up with the evacuees has taken place since well control was gained – please indicate if there are any outstanding issues at this time,
   - copies of any letters distributed to the area residences and businesses.

5. Environmental Impacts, including:
   - Air:
     - all of the Appendices and Figures associated with Appendix 12 of the Acclaim report,
     - raw data gathered from each of the mobile air monitoring units,
     - results for all internal calibrations on each mobile and stationary air monitoring unit including the AENV audits,
     - expiry data of the compressed gas or permeation tube, and documentation of when and how calibration flow rates were last checked,
     - schedule of utilization for each of the air monitoring units.

   - Soil:
     - analysis for any contaminated soils removed from the site and the disposition location(s), including a summary report of the shipping documents,
     - a copy of the reclamation plan for the 2-26 well site,

- a communication plan to ensure landowners and other government stakeholders are kept current with findings.

- Surface and Ground Water:
  - a site diagram showing the handling and storage of produced water, from the wellbore to the surface pits (similar to that posted on Acclaim's website during the incident),
  - locations of the disposal wells used for the produced water, including class of well, company name, volumes, and a summary of the shipping documents,
  - a ground water quality summary report, complete with detailed map showing the domestic, monitoring and dewatering wells, discussing sampling results to date, baseline or normal chloride levels of the aquifer, and communication of results with landowners and government agencies, *
  - comments on the effectiveness of the "Solid and Ground Water Protection Action Plan".

Again, where matters listed above have been marked with an asterisk (*), you are requested to provide the time at which specific actions were taken.

Appendix 4 EUB Letter/Questionnaire to Government Responders

February 4, 2005

TO: All parties on the attached list

ACCLAIM 2-26-52-26W4M BLOWOUT
UPSTREAM PETROLEUM INCIDENT SUPPORT PLAN (UPISP)
INCIDENT RESPONSE REVIEW

At the conclusion of the Acclaim well blowout west of Edmonton, the Alberta Energy and Utilities Board (EUB) issued a news release indicating that it would begin its investigation into the incident. This release noted that the investigation would focus on a number of matters directly related to the blowout, including:

- What caused the blowout to occur,
- How Acclaim, the EUB, and all authorities implemented the Upstream Petroleum Incident Support Plan in response to the blowout, and
- The effectiveness of Acclaim's emergency response plan and its implementation, among other matters.

The release also mentioned that the EUB would look into other issues such as the regulatory requirements related to suspended wells, Acclaim's operational history, and other matters that may surface as the investigation progresses.

In approving the drilling and operation of wells, the EUB relies on the emergency response plan of the company and the UPISP to discharge its public safety mandate. Since the EUB committed to review the government organizations' implementation of the UPISP and established the Regional Emergency Operations Centre in its St. Albert Field Centre, it is important for the EUB to learn more about how each organization participated in this incident. This review will focus upon improving response coordination and providing a "lessons learned" document to be shared with all partners. This may result in recommendations to improve the Upstream Petroleum Incident Support Plan or in recommendations to improve organizational response obligations.

To facilitate this review, the EUB would appreciate your cooperation in two ways:

1. completing the attached questionnaire, or an electronic version, to be returned to the EUB, and if necessary,
2. participating in a multi-organization debriefing hosted by the EUB, to review and discuss a consolidation of the information the EUB receives. If a debriefing is held you will be advised of its time, date and location.

The EUB recognizes some organizations had limited involvement during the incident; however, any comments offered would be of assistance. Please send all responses to Ken McMorris in the EUB's St. Albert Field Centre, 30 Sir Winston Churchill Ave, St. Albert AB T8N 3A3 on or before February 28, 2005. Electronic versions should be sent to ken.mcmorris@gov.ab.ca.

Questions or concerns may be directed to Ken McMorris at (780) 460-3807.

Yours sincerely,

J. D. Dilay, P.Eng.
Board Member
Alberta Energy and Utilities Board

JDD/pjk
Attachments
p.c. E. May, Special Projects – Field Surveillance, EUB
D. Waisman, Executive Manager, Field Surveillance, EUB
D. Boyler, Executive Manager, Compliance and Operations, EUB

February 4, 2005 Attachment 1

ACCLAIM 2-26-52-26W4M BLOWOUT
UPSTREAM PETROLEUM INCIDENT SUPPORT PLAN (UPISP)
INCIDENT RESPONSE REVIEW

Questionnaire to UPISP organizations

Note: Where items are marked with an asterisk (*) please provide the time at which specific actions were taken as well as your comments as to the effectiveness of these actions (what worked well and where improvements need to be made).

Debrief Review:

1. Describe your organization's role as laid out in the UPISP and comment if it met your mandate and obligations to the UPISP. An overview, including conclusions and recommendations from Alberta Environment and Capital Health with respect to air, water, groundwater and soil monitoring would also be appreciated.

2. Describe how and when your organization was notified and comment as to whether or not the notification met your expectations. Please comment about any commitments your organization had, both internally and externally, to meet the notification expectations of other responders.*

3. Discuss your organization's need to have a representative(s) on-site at 2-26. Describe your organization's on-site involvement and your communication with the Regional Emergency Operations Centre (REOC).*

4. Discuss your organization's need to have a representative(s) at the REOC. Describe your organization's involvement at the REOC and comment if it met your expectations. Please comment as to whether or not the functionality of the REOC met the expectations of the UPISP*

5. Describe the gathering and dissemination of information and communication (i.e. meetings, minutes, REOC up-dates, and the like) established through the REOC. Please comment with respect to your organization's ability to keep its senior management and/or government officials fully informed about the incident.*

6. Describe your organization's views of the overall operations at the REOC. Please comment on the facility, accessibility, equipment (i.e. fax, photocopier, etc.) support, administrative staff, meeting arrangements, information documentation (i.e. flip charts, maps, etc.), hours of operation, cell phone coverage, meals, security, and the like.

7. Comment as to whether or not your organization believes other responders should have been represented at the REOC.

8. Please feel free to add additional comments.

Appendix 5 Acclaim's Revised Well Servicing and Workover Operating Procedures

The specific procedures that Acclaim will implement to minimize the presence of air and prevent downhole explosions are as follows:

End-of-Day Operations Procedure

1) Pick up and run in the hole with tubing fluid control valve, packer, and circulation port (closed position).
2) Land and set packer above line top or as close to perforations as possible.
3) Open the circulation port.
4) Circulate wellbore to fresh water while holding back pressure on return side. This procedure allows for complete wellbore gas purge, mitigating any conditions for underground explosions to occur, regardless of the operation being executed.
5) Close the circulating port.
6) Shut in and secure the well until further operations are initiated.

Morning Operations Procedure

1) Check for pressures.
2) Open the circulating port (tubing should be on vacuum).
3) Release packer and commence pumping fresh water down backside.
4) Continue with normal daily operations.

Appendix 6 Levels of Emergency (taken from the UPISP)

Guide for Determining Impact Level and Possible Actions				
Community Impact Level	**Criteria**	**Incident Examples**	**Possible Upstream Operator Actions**	**Possible Government Actions**
Level 1-Low Impact	• No danger outside of operator's property. • Immediate control of hazard source. • No immediate danger to the public. • Minimal environmental impact. • Little or no media interest. • Situation handled entirely by operator's on-site personnel.	• A small release or potential for a small release of product with no potential for off-site impact. • Missing person on site. • Operator or contractor worker injury. • Serious property damage. • Receipt of complaint call. • Credible threat to an upstream facility or infrastructure. • Breach of site security or trespassers on site. • Small fire or explosion with no injuries, community impact or essential equipment damage.	• Operation response made. • Reported as required internally. • Complies with appropriate government reporting requirements. • Additional company personnel may be placed on stand-by status. • The upstream operator's initial response is undertaken in accordance with the operator's emergency response plan (either the site specific or corporate plan).	• No response action required. • Situation monitored. • The regulatory authorities may investigate event.

(continued)

Guide for Determining Impact Level and Possible Actions				
Community Impact Level	**Criteria**	**Incident Examples**	**Possible Upstream Operator Actions**	**Possible Government Actions**
Level 2-Moderate Impact (Notification mandatory)	• No immediate danger outside operator property, potential exists for off-site impact. • Appropriate municipal and provincial organizations must be notified of the Level 2 incident. • Imminent control of the hazard is probable. • Moderate threat to the public. • Moderate environmental impact. • Local or regional media interest. • There is great concern and anxiety on behalf of the public.	• Confirmed release with imminent control of the hazard possible. • Injuries or accidents involving the public. • Closure of a primary or secondary highway. • Issue of NOTAMS. • Closure of rail line. • Mischievous acts by trespassers that could threaten public safety. • Fire or explosion that has direct impact to public safety. • Major spill with widespread environmental impact.	• The operator fully activates their emergency plan. • Internal and external response resources are mobilized. • The upstream operator establishes an OSCP. • The local authority is notified and may partially activate the MEOC. • The EUB must be immediately notified. • Public safety actions are implemented (e.g., evacuation, sheltering or planned ignition). • SitReps are provided to the EUB and or other partners. • News media communications are prepared and released.	• The upstream operator has the capability to manage and control the incident using company resources and expertise with some assistance from the local authority and government agencies. • A government department receiving a level 2 notification will immediately notify the EUB who will activate the call-down and notification system. • The EUB activates this plan. • EUB may request that the COMOC be placed on stand-by or activated. • The EUB may request that appropriate government department personnel be mobilized for supporting the response.

(continued)

Guide for Determining Impact Level and Possible Actions				
Community Impact Level	**Criteria**	**Incident Examples**	**Possible Upstream Operator Actions**	**Possible Government Actions**
Level 3-High Impact	• The safety of the public is jeopardized. • The hazard source is not controlled. • Significant or on-going environmental impacts. Immediate multi-agency (operator, municipal, provincial or federal) response. • Assistance from outside specialists is required.	• Monitored H_2S levels reach ignition criteria. • Major incident with impact on the public. • Explosion with extensive damage to public facilities. • Mischievous acts which result in major public impact. • Major fire in a populated area. • Major forest fire resulting from an upstream petroleum incident.	• Upstream operator's response is at maximum. • Upstream operator notifies the EUB and the local authority. • Upstream operator established and operates OSCP and CREOC. • Upstream operator dispatched liaison staff MEOC and COMOC. • Upstream operator mobilizes corporate emergency response resources (e.g., public affairs, legal, executive, etc.).	• A government department receiving a level 3 notification will immediately notify the EUB who will activate the call-down and notification system. • EUB activates the plan. • EUB requests that the COMOC be activated. • EUB requests that government department response personnel be dispatched to the OSCP and REOC. • Liaison personnel dispatched to REOC, MEOC, and COMOC as required. • Public and Media Inquiry Room mobilized. • COMOC partially or fully activated to support the upstream operator and the municipal response.

Appendix 7 Acclaim Corporate ERP Review Chart

Description of applicable section in *Directive 71: Emergency Preparedness and Response Requirements for the Upstream Petroleum Industry*	Description of Acclaim's corporate-level emergency response plan to address section requirement	EUB review (only deficient items are noted)
Section 1.4.1 In accordance with Sections 8.002(1) and 8.002(2) of the *Oil and Gas Conservation Regulations* (OGCR) and Sections 50.1(1) and 50.1(2) of the *Pipeline Regulation* pursuant to the *Pipeline Act*, the EUB requires all licensees to have, as a minimum, a corporate-level ERP. Corporate-level ERPs do not require EUB approval but must be submitted for review upon request.	• Acclaim has submitted a corporate-level ERP.	
Section 3.1.1 Table 2: Criteria Matrix for Classifying Incidents must be included in a corporate-level ERP and used to classify all incidents. As a minimum, the actions outlined in Table 3: Possible Responses for Specified Incidents must also be included in a corporate-level ERP. In addition to these requirements, a corporate level ERP must also define appropriate actions, including public protection measures that a licensee could take at each level of emergency.	• Pages 2-2 to 2-4 refer to the criteria matrix in *Directive 71*. • Pages 2-2 to 2-4 outline the general actions to be taken (both by the company and government agencies) at each level of emergency. Public protection measures for each level of emergency are also included.	
Section 3.1.2 Procedures must be established and detailed in the ERP for contacting and maintaining communications with key licensee personnel, government, support services, members of the public (within and outside of the EPZ), and the media. The licensee is required to identify all key communications systems and equipment needed to effectively respond to an emergency.	• Page 4-3 provides an Emergency Communication & Organization Structure Chart, which outlines the general flow of communication between responders. • Pages 4-4 to 4-10 (roles and responsibilities) describe the communication and reporting procedures, i.e., who reports to, and maintains communications with, and is responsible for notifying and updating appropriate government agencies. • General communication systems and possible types of communication equipment are described.	• The purpose of the Emergency Communication & Organization Structure Chart is unclear, as it does not reflect all of the (key) emergency responder positions described in the ERP. In addition, reporting and communications described in the roles and responsibilities section are not reflective of what is displayed on the Emergency Communication & Organization Structure Chart.
Section 3.1.2.1 An ERP must clearly define the responsibility to contact the EUB and other responders in the event of an emergency. The EUB must be notified at any level of emergency. The level of emergency is determined by the licensee according to its plan and confirmed through consultation with the EUB. The licensee must also contact agencies and services required to assist with initial response, which may include contacting the local authorities at a Level-1 emergency if required. At a	• Page 4-3 provides an Emergency Communication & Organization Structure Chart, which outlines the general flow of communication between responders and government agencies. • Pages 4-4 to 4-10 (roles and responsibilities) describe the communication and reporting procedures, which include who is responsible for contacting and updating appropriate government agencies.	• The ERP does not clearly reflect the notification criteria outlined in Figure 2 of *Guide 71*, as the licensee is required to contact the EUB, local authority, RCMP, and regional health authority for Level-2 and -3 emergencies. • Page 5-5 indicates that local disaster services are notified at Level-1 emergency, but this is not clear in the roles and responsibilities outlined in pages 4-4 to 4-10.

Description of applicable section in *Directive 71: Emergency Preparedness and Response Requirements for the Upstream Petroleum Industry*	Description of Acclaim's corporate-level emergency response plan to address section requirement	EUB review (only deficient items are noted)
Level-2 or -3 emergency, the EUB contacts Emergency Management Alberta, which implements the fan-out calls to the required government departments and agencies, as indicated in Figure 2.		
Section 3.1.2.2 The ERP must clearly describe the procedures that will be implemented during the incident to contact and maintain communications with directly impacted members of the public in order to keep them informed of the situation and actions being taken. This includes plans for communicating and implementing public protection procedures, such as evacuating and sheltering occupants within and beyond the EPZ. The ERP must also clearly describe procedures that will be used to inform and update the media and provide assistance in getting factual messages out to the public at large in an expeditious manner. Media releases must be generated and released as significant developments occur. A licensee coordinates media releases with the EUB prior to release to ensure consistency and accuracy of information. Information is communicated through written news releases, new conferences, and any other effective means the licensee chooses to use. A licensee spokesperson is identified to carry out this role and to interact with the EUB and other applicable government agencies. The following information must be released to the general public as soon as possible during an incident: • Type and status of incident • Location and proximity of incident to people in the vicinity • Areas impacted by the incident • Effects the incident may have on people in the vicinity • Actions the general public should take if they experience adverse effects • Description of the products involved and their short- and long-term effects • Public protection measures to follow, evacuation direction, and any other emergency response measures to consider	• The ERP describes public/worker and environmental safety procedures in pages 5-1 to 5-7. Included are procedures for notification, sheltering, and evacuation of the public, the criteria used to determine which public protection measures are to be employed, and the corresponding level of emergency. • The ERP contains forms to be used when contacting and evacuating the public. Forms 8 and 9 specifically document contact information, registering of evacuees, and where the public can be reached for updates. • Pages 6-5 to 6-7 describe the procedures for informing and updating the media and general public through news releases. • The ERP contains guideline statements used for generating news releases.	• The guideline statement for news releases does not contain all of the required information specified in *Directive 71*, Section 3.1.2.2. The following items are missing: – Effects the incident may have on people in the vicinity – Actions the general public should take if they experience adverse effects – Description of the products involved and their short- and long-term effects – Public protection measures to follow, evacuation direction, and any other emergency response measures to consider • The ERP indicates on pages 2-2 and 5-5 that residents identified as having special needs will be provided with early/voluntary evacuation notification. The ERP does not detail how residents will be identified as having a special need when no personal/contact information has been collected.

Description of applicable section in *Directive 71: Emergency Preparedness and Response Requirements for the Upstream Petroleum Industry*	Description of Acclaim's corporate-level emergency response plan to address section requirement	EUB review (only deficient items are noted)
• Actions being taken to correct the situation and time period anticipated • Contacts for additional information		
3.1.2.3 Once a situation improves the decision to downgrade a Level-2 or Level-3 emergency is made by the licensee in consultation with the EUB and local and provincial disaster service authorities. All affected persons and the media must be kept informed of the status of the emergency.	• The ERP contains procedures for downgrading an emergency, in conjunction with the EUB and municipal and provincial disaster services. The ERP also includes communication procedures to ensure that all affected parties and media are informed.	
Section 3.1.3 The ERP must also identify specific roles and responsibilities of personnel required to effectively respond to any emergency. Key personnel and responders and their alternates must also be identified. The following responsibilities must be assigned to specific personnel as applicable: • Field incident command • Public safety coordination, including evacuation and sheltering • Security (roadblocks, rovers, etc.) • Air quality monitoring • On-site safety and ignition • Communications with responders and media/public communication	• Pages 4-4 to 4-10 describe the roles and responsibilities assigned to each responder position. These positions address field incident command, public safety coordination, security, air quality monitoring, on-site safety and ignition, and communications. • On page 4-6, at a Level-2 emergency the incident commander will delegate a public safety coordinator as deemed necessary.	• Alternates are not referenced in the ERP for all key responder roles. • While a public safety coordinator position is referred to in the ERP, there are no responsibilities described for the public safety coordinator, nor is the public safety coordinator referred to in the flowchart on page 4-3. Further, it is unclear, as to what criteria the incident commander would use in making the decision to delegate a public safety coordinator "as deemed necessary."

Description of applicable section in *Directive 71: Emergency Preparedness and Response Requirements for the Upstream Petroleum Industry*	Description of Acclaim's corporate-level emergency response plan to address section requirement	EUB review (only deficient items are noted)

Section 3.1.4 The ERP must describe how the licensee will manage and coordinate a response to an emergency. It must identify which response management centres are to be activated as a result of a worst-case emergency at its operations, address the roles and responsibilities of personnel at each centre, and outline how coordination and communication between centres will be managed.
 	
The ERP must clearly outline the communication procedures to be used between response management centres to ensure adequate information flow among licensee representatives and other responders at the emergency site, corporate-level decision makers, the EUB, and other government agencies. The *Upstream Petroleum Incident Support Plan* provides the details on the usual roles and responsibilities of the centres, at which level of emergency each may be activated, the persons who should attend, and required communication links. A licensee must use the same terminology for the centres as in the government plan.
 	
In the event that evacuation is required, a licensee must activate a reception centre located outside the EPZ. The ERP must identify the licensee responsible for opening the reception centre and meeting evacuees. Any concerns the evacuees may have should be addressed at this time. Once evacuees have been registered at the registration centre and have indicated where they may be contacted, they are free to go as they please, or if they wish it, the licensee must provide assistance in arranging temporary accommodation.
	• The ERP describes the purpose, activities, and location of each command centre.
	• The ERP describes the procedures used in the event an evacuation centre is opened. An evacuation centre coordinator is assigned to account for, register, and address any evacuee needs.
	• The ERP defines three "emergency response operating areas" for personnel responding to an emergency. An evacuation centre is established in the green zone, a safe area.
	• The public affairs leader dispatches personnel to field locations, media information centres, and/or Government Emergency Operations Centre.
		• The ERP does not consistently outline the communication procedures to be used between the command centres.
		• As per the ERP, the public affairs leader dispatches personnel to field locations, media information centres, and/or Government Emergency Operations Centre:
		  - Uncertain as to who these personnel report to and maintain communication with.
		  - No clearly described responsibilities for subject personnel.
		  - Improper terminology to refer to a "Government Emergency Operations Centre."

Appendix 8 Government UPISP Response Requirements and Observed Actions

Government agency	Response or concerns during incident	Response according to government plan	Investigation team comments
Alberta Environment	- Activated MAML and maintained on site. - Maintained staff 24/7 at REOC. - UPISP did allow for effective AENV participation. - Incorrect classification of levels prevented effective mobilization of MAML and staff. - AENV presence at well site of limited value except for MAML. - Staff at REOC provided answers to issues.	• If notified of an upstream emergency, informs EUB and EMA of the incident.	AENV did not receive the initial call and was notified by ERG at a Level-1 designation.
		• Provides representation to the OSCP 24/7 when requested.	Met the UPISP expectations.
		• Provides representation to off-site REOC when established on a 24-7 basis when requested.	Met the UPISP expectations.
		• Provides oversight role in ensuring that air monitoring needs and activities associated with public safety around event site are adequately addressed by the licensee.	The EUB assumed this role. The investigation team believes that the definition of "oversight role" needs to be more clearly defined in the UPISP.
		• Ensures that the licensee is maintaining the air monitoring log.	The EUB assumed this role. The investigation team believes that the definition of "oversight role" needs to be more clearly defined in the UPISP.
		• Participates in the evaluation of potential area at risk from product releases.	Met the UPISP expectations.
		• Provides assistance in monitoring discharges and ensuring that appropriate actions are taken to reduce the impact of liquid releases for land-based spoils and to ensure watercourses are protected.	Met the UPISP expectations.
		• Sends an Environment Protection Order to COMOC when requested by EMA.	COMOC was not established for this incident.
		• Carries out investigation, when required, having regard for the existing investigative protocols and procedures.	Not aware of any investigation of the Acclaim incident by AENV.
AH&W	- Not aware of identified role in UPISP. - Would like contact on information items. - Expected to hear from RHAs. - No need to be represented at well site. - No need for presence at REOC.	• Nothing identified in UPISP Task Matrix, although AH&W did have input into developing the UPISP.	The AH&W response indicates that the agency would at the very least like to be notified of an incident so that it can keep its respective organizations informed. The Minister of AH&W needs to be assured that public health issues are being adequately addressed and communicated .
Alberta Infrastructure and Transportation	- 24 hour on-call centre for EMA and for AENV. - Information was slow to come to centre but all info was reported accordingly.	• On-Call Centre for EMA. • No specific duties outlined in UPISP.	Met the UPISP expectations by relaying information to the appropriate people. Interesting comment about scheduling training in February for all staff to enable them to access EMA's incident tracking logs to provide better information sharing. This implies that internal communication problems can be improved.
Capital Health (CH) Region	- Want clarification of tasks outlined in UPISP. - Notification process was problematic. - Confusion created difficulty for CH to accurately respond. - CH reps should have been permitted to attend at well site.	• Provides representation at the off-site REOC when it is established or as requested.	Met UPISP expectations.
		• Provides health-related information about toxic chemicals and by-products.	The issue of health information needs to be more clearly defined in the UPISP.
		• Establishes accurate information to the public concerning the incident.	
		• Establishes health and safety information for product releases.	

Government agency	Response or concerns during Incident	Response according to government plan	Investigation team comments
(CH) (cont.)	- Representation is essential at REOC. - Facility did not meet UPISP requirements for communications.	• Monitors the health effects resulting from the event and ensures that appropriate data are collected and maintained.	Met UPISP expectations.
		• Investigates health complaints from the public.	Met UPISP expectations.
		• Provides advice to the COMOC and to the REOC on the existing or potential health effects associated with the incident.	Met UPISP expectations.
		• Provides health advice and safety levels for any health or special care facilities or for other persons likely to be sensitive to the impact as a result of the incident.	Met UPISP expectations.
		• Ensures local hospitals are alerted when there is potential for an impact from a release.	Not applicable to this incident.
		• Completes incident-related reports.	The investigation team is not aware of any incident-related report from the Capital Health Region.
City of Edmonton	- Not required to respond. - Provided a municipal liaison officer to REOC. - Not required to have a rep at well site. - Absence of EMA and Parkland County from REOC was noted.	• Event was outside of city jurisdiction and the city of Edmonton was not required to respond to the incident site.	Given that the incident was close to the City of Edmonton, the city showed due diligence in providing a municipal liaison officer to the EUB REOC for the duration of the operation. The City of Edmonton expressed concern that it was not contacted within the first 24 hours by the EUB or Acclaim.
Parkland County	- Acknowledged responsibilities in UPISP. - Municipal emergency plan (MEP) partially activated. - Parkland County assumed a support role to Acclaim. - On-site involvement included mobile command unit, fire-fighting forces, and fire chief. - No need to have representation at REOC.	• Work with the upstream operator to effectively prepare for an upstream petroleum industry incident. Provide input to the industrial operator's site-specific plan to ensure that it is compatible with the MEP.	Acclaim used a corporate ERP. There is no expectation for this to occur unless there was a site-specific plan required.
		• If notified of an upstream emergency, notify the EUB and EMA of the incident.	No requirement, since Acclaim had told Parkland County that it had already notified the EUB.
		• Respond and assess emergency incident.	Met the expectations of UPISP.
		• Activate the emergency public warning system to alert people to life-threatening hazards as required.	This was not a life-threatening event. No record of an emergency public warning system being activated as there was no need to activate the system.
		• Initiate public protection option as required.	What started out as an initial notification of residents in close proximity to the well ended with a substantial evacuation well outside the well emergency planning zone.
		• Establish and maintain communications with industrial operator during an emergency.	Acknowledged that their specific role was to provide support to the operator's ERP through their disaster services plan and maintained people at the 2-26 well site.
		• Activate MEP when required.	Parkland County states that MEP was partially activated after they became aware of the incident.

Government agency	Response or concerns during incident	Response according to government plan	Investigation team comments
Parkland County (cont.)		• Manage the local authority's emergency response. • Dispatch a representative to the off-site REOC when established to coordinate the response. • Activate the municipal EOC as required. • Coordinate with the industrial operator the establishment and the administration of reception centres for evacuees as required	Parkland County did not send a representative to REOC. The UPISP leaves the decision to activate the MEOC to the local authority's discretion "as required." The investigation team notes the comment from the City of Edmonton where they indicated that a MEOC would have been established to manage the incident if the incident had occurred within the jurisdiction of the City of Edmonton. Did not coordinate or establish a reception centre for the evacuees. UPISP leaves the decision to establish a reception centre to the local authority's discretion "as required." If the Parkland County emergency responders, when speaking with Acclaim, had clarified some of the details about the evacuation, this may have triggered discussion about the need to evacuate in the first place.
		• Assist with the establishment of roadblocks and maintain them.	Met UPISP expectations.
		• Assist with fire protection.	Met UPISP expectations.
		• Provide emergency medical assistance as required.	Met UPISP expectations.
		• If necessary, declare a local state of emergency.	It was not necessary to declare a local state of emergency.
		• Establish a public information service, including the use of the news media, to inform and instruct the public of the emergency and of any protective actions to be taken.	The requirements to meet what is expected must be clarified.
		• Provide timely news releases.	This doesn't appear to have happened.
		• Compile a municipal log.	The investigation team has not seen a municipal log.
		• Conduct municipal incident debriefing.	No information as to whether Parkland County has conducted a debriefing.
EMA	- Duty manager carried out correct call-out protocols. - Determined if EUB required activation of COMOC. - Received conflicting reports. - In contact with local authorities and CHA. - Apparently not notified of the Level 2. - EMA assistance not required/ did not send rep to REOC. - No need for a rep on site. - REOC needed to distribute summary reports early in the process. - There is a need to update the UPISP.	• If notified of an upstream emergency, informs the EUB, AENV, and the local authority of the notification.	Met UPISP expectations.
		• Upon notification of an emergency event of moderate (Level 2) or high (Level 3) impact, completes the provincial government notification and calldown, as shown in Appendix I of the UPISP.	The calldown at Level 2 did not happen. When notified of the Level 3 designation, EMA decided not to make the callout, indicating that they felt everyone already knew about it.
		• The EMA duty manager obtains a Situation Report from the EUB, industrial operator, or local authority and confirms the level of impact.	It doesn't look like the EMA duty manager talked directly to the EUB. The ERG on-call staff member indicated that contact was made with the on-call centre when the incident was classified from a Level 1 to a Level 2. There was no confirmation of the level of impact with the duty manager.
		• The duty manager notifies the appropriate provincial officials as per operating procedures.	Met UPISP expectations.
		• Prepares briefing note as appropriate.	The investigation team has not seen a briefing note.
		• When requested by the local authority, dispatches EMA district officer to the Municipal EOC.	No MEOC established.
		• Upon request by the EUB, dispatches an EMA representative to the REOC near the event site.	The EUB was not clear in its request to have EMA attend the REOC.
		• Upon request by the EUB or the local authority, partially activates or activates the COMOC to coordinate and support response activities to the event with provincial resources.	No request to activate COMOC.
		• Upon request by the EUB, partially or fully activates the Public	Not requested.

Government agency	Response or concerns during Incident	Response according to government plan	Investigation team comments
EMA (cont.)		Media Inquiry Report to support and coordinate public and media information.	
		• Provides ongoing situation reports or briefing notes to appropriate provincial officials.	EMA requested information from REOC. No information as to whether EMA provided a Significant Incident Report (SIR) to the office of the Minister of Municipal Affairs, the Municipal Affairs DM, ADM Public Safety, Director of Communications, and the EMA Executive Director. EMA was able to keep senior management, communications staff, and federal authorities informed on the incident.
		• Notifies plan holders when the event is over.	Completed by REOC.
		• Completes report in relation to the activation of this plan and the incident.	To date, the investigation team is not aware that EMA has completed a post-audit review and report.
Enoch Cree Nation	- No direct contact with REOC. - No role at the well site. - Should have had major role at the REOC with the same status as a municipality.	• Nothing identified in UPISP Task Matrix.	The UPISP will need to clearly identify the roles and responsibilities of First Nations in the next revision to the UPISP Task Matrix. Should have been treated as a municipal district.
Environment Canada	- AENV did not meet EC's expectations WRT the *administrative agreement*. - No opportunity to be represented at REOC. Should have had some sort of representation because of Enoch Cree Nation concerns.	• Nothing identified in UPISP Task Matrix.	Considerations should be given to identifying communication links in the UPISP with Environment Canada when an incident occurs in proximity to a First Nations reserve or any area where the federal government has a vested interest.
Health Canada (HC)	- Exclusion from UPISP does not meet HC mandate for First Nations. - Lack of formal notification did not meet expectations. - HC was invited to REOC once role was understood. Should have been there from the start. - UPISP and *Directive 71* are not consistent in terms of agencies being consulted.	• Nothing identified in UPISP Task Matrix.	Consideration should be given to identifying communication links in the UPISP with HC when an incident occurs in proximity to a First Nations reserve or any area where the federal government has a vested interest.
RCMP	- Under UPISP, RCMP is a resource of local authority. - RCMP met its mandate under the task list. - On-site involvement limited. - Most resources dedicated to road blocks and evacuations. - RCMP should have been represented at REOC. Apparently it was not invited.	• Prior to dispatching staff to scene, contact the nearest EUB Field Centre to determine the hazards associated with the incident and other incident information.	The EUB was not contacted by the RCMP prior to dispatching an officer to the site or prior to conducting the evacuation.
		• Establish contact with the industrial operator in order to obtain additional hazard information, determine where road blocks should be located, determine the direction of approach to the incident, determine if there are injuries, find out what response and public protection actions have been taken by the upstream operator, identify what resources are required, where they should be staged, and the location of the OSCP and any EOCs.	Met expectations. The RCMP Watch Commander did contact the on-site Acclaim representative to establish communication and gather additional information to make further notifications.

Government agency	Response or concerns during Incident	Response according to government plan	Investigation team comments
RCMP (cont.)		• Respond and assess emergency incident.	Met UPISP expectation.
		• Establish a unified OSCP.	The licensee established an on-site command post. However, the RCMP involvement on site was restricted due to lack of appropriate safety equipment and training to deal with H_2S. An on-site RCMP member would have been beneficial to fully understand the scope of the problem and establish initial communication. The investigation team believes this should be addressed in the UPISP.
		• Communicate to MEOC and provide situation reports as required.	A MEOC was not established.
		• Initiate public protection option when necessary.	Unclear as to what the expectations are. The investigation team believes this should be addressed in the UPISP.
		• Dispatch a representative to the off-site REOC when it is established to coordinate the response.	The REOC did not invite the RCMP. The RCMP did not receive updates from the REOC until it requested information.
		• Maintain roadblocks as necessary.	Met UPISP expectations.
		• Assist with fire protection.	Not applicable.
		• Provide emergency medical assistance as required.	Not applicable.
		• Provide timely news releases.	Not aware of any news releases from the RCMP.
		• Inform EMA and the public when the emergency is over.	Done by REOC.
		• Conduct a damage assessment.	Not applicable.
St. Albert – EUB Field Centre	- Acted as lead provincial agency in providing government support to Acclaim. - Received and provided notifications. - Determined the level of impact of the incident. - Dispatched rep to site. - Established and manned REOC. - Initiated a full investigation. - Informed management within the EUB and within all government families. - Coordinated media releases through the REOC	• Receives 24/7 notifications of emergency.	Met UPISP expectations.
		• Through consultation with upstream operator, determines the level of impact of an incident.	Acclaim initially called this incident a Level 3 and had activated its ERP at that level. The EUB maintained that this incident was a Level 1 based on previous experiences in this area. There was no consensus as to the proper level of this emergency. The EUB should review the criteria for determining levels of emergencies for consistency and clarity.
		• Dispatch EUB representative to the site of incident as required.	Met UPSIP expectations.
		• Confirm or request initial local or provincial resources required to respond to the emergency. Notify EMA. Additional requests for provincial/federal response resources may be made through Alberta Municipal Affairs (AMA)-EMA.	Met UPSIP expectations.
		• Activate this plan when required.	Met UPSIP expectations. Plan activated when the incident was raised to a Level 2.
		• Confirm or implement public safety actions taken to ensure the safety of the public and property.	Confirmed that evacuation was under way but failed to relay that information to the ERG or EMA within an appropriate timeframe.
		• Provide situation reports to EMA on a timely basis.	EMA indicated that it received very little information prior to being told that the incident was being raised to a Level 3.
		• Send an EUB representative to the OSCP.	Met UPISP expectations.
		• Establish an off-site REOC or request the activation of the COMOC to serve this function until the REOC is operational.	REOC was established on December 13, but an argument could be made that it should have been established earlier because of the evacuation, gas flow, and proximity to the city.
		• Dispatch staff to open and operate the off-site REOC.	Met UPISP expectations.
		• Establish the off-site REOC PMIR as required.	Not requested.
		• Request the deployment of other provincial government department staff members to be sent to the off-site REOC.	Apparently the RCMP was not invited to attend the REOC.

Government agency	Response or concerns during Incident	Response according to government plan	Investigation team comments
St. Albert – EUB Field Centre (cont.)		• Request a local authority liaison officer to work at the off-site REOC.	Met expectations. Parkland County was invited to attend the REOC.
		• In conjunction with the industrial operator, provide timely situation reports to partners activated by this plan and issue timely news media releases.	Comments indicated that timely news media releases were not provided initially; however, matters greatly improved after the REOC was established and fully functioning.
		• Request EMA to partially or fully activate the COMOC should provincial coordination or provincial resources be required.	Met UPISP expectations.
		• Recommend the closure of the COMOC.	COMOC not activated.
		• Notify all participants when the event has concluded and there is no longer any hazard to the public.	Handled by REOC.
		• Carry out investigations.	Met UPSIP expectations.
		• Recommend any mitigative actions that may reduce the event from recurring.	Will meet this expectation by way of recommendations in this report.
		Address community concerns.	Was done (met during incident). Follow-up will occur.
Workplace Health & Safety (WH&S)	- Response focuses on well site to ensure compliance with OH&S legislation. - Decided not to have a rep at REOC.	• If notified directly by the upstream operator of an emergency, inform the EUB.	EUB notified first and then notified WH&S.
		• Provide a liaison officer to the REOC or an Environmental Protection Order to the COMOC when requested.	Was invited to attend REOC but decided to focus on attendance at the OSCP at the 2-26 site to ensure compliance with OH&S code and legislation.
		• Monitor the health and safety aspects of applicable occupations within the hazard area to ensure that the necessary precautions are taken to protect worker safety.	Met UPISP expectations.

Appendix 9 Summary of Responses to EUB Questionnaire

Question 1: Describe your organization's role as laid out in the UPISP and comment if it met your mandate and obligations to the UPISP. An overview, including conclusions and recommendations from Alberta Environment and Capital Health with respect to air, water, groundwater, and soil monitoring, would also be appreciated.	
Alberta Environment	• Role during a Level 3 consists of activating Mobile Air Monitoring Lab (MAML) and maintaining it at site 24/7. • AENV will place staff 24/7 at REOC and at site to collect info from MAML to ensure it is disseminated on site and at the REOC. • AENV staff will assist company in developing a soil and water sampling program as required. • The UPISP as developed did allow AENV to meet its obligations during this incident.
Alberta Health & Wellness	• Not aware that AH&W has an identified role in the UPISP. • Should be contacted on incidents as an information item.
Alberta Infrastructure and Transportation 24-hour on-call centre	• 24-hour on-call centre for EMA and listed in UPISP as first contact for any incident that falls under UPISP. • Mandate is to receive first call and relay information to EMA on-call duty manager for further action. • Also is the call centre for Alberta Environment and relays information to on-call investigator responsible for region where the incident occurs.
Alberta Infrastructure and Transportation	• No defined role in the UPISP.
Capital Health Region	• The Task Matrix (Appendix H-7) of the UPISP outlines the role of the RHA before, during, and after an event. The functions indicated were developed for the UPISP by Alberta Health. It should be noted that the RHA view of tasks associated with an event and the discharge of those tasks could vary from RHA to RHA. • Capital Health is prepared to participate in the review and testing of the UPISP on a regular basis. It highly recommends that such review and testing be undertaken annually. • The description of the tasks outlined in the UPISP requires some clarification. Communication of imminent risks to the public's health is a mandate of public health professionals. The public information provided by CH was based upon the monitoring information presented to them. The availability of information, particularly at the beginning of the event, was limited, as separate meetings were held between the EUB and the company and then information shared with all parties. However, information and participation of all parties in decision-making improved as the event continued. Air monitoring information was available the afternoon of the event. The provision of the information continued and responses to specific requests by CH for air quality information at particular locations was provided expeditiously. • Emergency response plans by the companies should establish air, soil, and water monitoring strategies and ideally establish baseline data sets for the geographical area. That prior information would enable decision-making more reflective of the impact on the affected area. Such information requests would be included in baseline data sets as "before the event" information in the task matrix.
City of Edmonton	• Event occurred outside the jurisdiction of Edmonton. • Not required to respond to the incident site. • Provided a municipal liaison officer to the EUB REOC for the duration of the operation.
Parkland County	• Acknowledged that it is the local authority and that responsibilities are described in UPISP. • Municipal ERP (MEP) partially activated after becoming aware of the incident. • Specific role was to provide support to the operator's ERP. • Acclaim assumed lead role and Parkland County assumed a support role related to its disaster services plan, coupled with its fire fighting force.
Emergency Management Alberta	• EMA has a Duty Manager (DM) on call 24/7. When the UPISP incident reaches Level 2, the DM will be contacted by the EUB through the Transportation and Rail Safety Coordination Information Centre (CIC) with the details of the incident. • The Duty Manager will subsequently conduct a calldown to ensure that AENV, Alberta Occupational Health and Safety, EMA District Officer, local authority, RCMP, and RHA are aware of the event. The EMA Duty Manager will almost always send a

Emergency Management Alberta (cont.)	Significant Incident Report (SIR) to the office of the Minister of Municipal Affairs, the Municipal Affairs DM, ADM Public Safety, Director of Communications, and EMA Executive Director. • In very sensitive cases, the Deputy Minister of Executive Council and other department emergency management officers may be informed. For Level 2 and higher, EMA determines as early as possible whether the EUB may require activation of the Consequence Management, and possibly the Crisis Management, Emergency Operations Centres.
Enoch Cree Nation	• Enoch Cree Nation is unaware of the UPISP but recently received a copy from the EMA First Nations Disaster Officer.
Environment Canada	• EC mandate is not described in the UPISP, which primarily envisions the role of EC and other federal departments as that of support rather than enforcement. • EC deems this reasonable, given the purpose of the UPISP, which is to mitigate the emergency.
Health Canada	• Not included under Section 1.3.4 of the UPISP. • Exclusion does not meet our mandate of providing environmental health-related services to First Nations communities. • Important that any data obtained in relationship to the Enoch Cree Nation is shared with Health Canada and the First Nations to ensure that all parties are fully aware of the situation. • Working with Capital Health to monitor ground water in the vicinity of the well incident. Also working with Enoch Health Centre to monitor ground water on reserve.
Stoney Plain/Spruce Grove RCMP	• Under the UPISP, the RCMP is a "resource" of the local authority, which in this case is Parkland County. • The RCMP met its mandate as an emergency responder under the task list for those areas in which it had jurisdiction.
St. Albert Field Centre	Believes that actions taken during the incident meet the EUB mandate as described in the UPISP. • Acted as lead provincial agency in providing government support to Acclaim. • Received and provided emergency notifications in a timely manner. • In consultation with Acclaim, determined the level of impact of the incident (this is one area where there was opportunity to elevate the level of impact in a more timely manner, considering the press coverage and the fact a large number of evacuations had taken place). Elevating level of impact would not have made a difference to response. Much of the confusion in early stages was caused by actions being taken that did not correspond to the information being received and the observations gathered at the site. • Dispatched rep to site. • Established REOC for information gathering and dissemination and provide timely updated situation reports. • Confirmed and implemented safety of public and property. Public was never at risk. There only were minor odour problems, which were not life threatening. • Initiated a full investigation.
Workplace Health & Safety	• WH&S response focuses on responding to the incident site. • WH&S mandate is to address occupational health and safety hazards and injuries and legislation related to workers at the accident site. • Includes investigation of serious injuries or fatalities suffered by workers related to the incident.

Question 2: Describe how and when your organization was notified and comment as to whether or not the notification met your expectations. Please comment about any commitments your organization had, both internally and externally, to meet expectations of other responders.	
Alberta Environment	• Advised of a Level 1 at about 10:00 a.m., December 12/04, by Acclaim. • EUB contacted AENV at about 10:30 a.m., December 12/04, but would not supply contact numbers to allow AENV updates on the situation. • Information supplied to AENV was sporadic and of questionable accuracy. Made it difficult for on-call staff to provide executive with accurate and timely information as incident unfolded. • Difficult for AENV to determine the level of involvement needed to meet obligations. • AENV was notified that this was a Level 3 24-hours after the incident. Mobilization of the MAMI. & staff delayed as a result.
Alberta Health & Wellness	• Not officially notified – learned of incident through inquiries.

Alberta Health & Wellness (cont.)	• Expected to hear from the RHAs but understand that they were also not notified.
Alberta Infrastructure and Transportation 24-hour on-call centre	• Notification of the incident came first from the RCMP on the AENV call line and minutes later from the EUB on the EMA line. • Both the on-call AENV investigator and the EMA duty officer were notified immediately of the RCMP and EUB notifications.
Alberta Infrastructure and Transportation	• No response.
Capital Health Region	• The notification process was problematic. Confusion as to the level and type of release (sweet or sour) created difficulty for an accurate response by CH to the event, to media, and to public inquiries. It was only after several calls by Capital Health staff to other agencies and the company that accurate information was obtained. Clearly, notification should be made for a Level 1 release where large urban or rural populations are potentially affected.
City of Edmonton	• Originally notified by Spruce Grove RCMP at about 9:00 a.m., followed by the District Officer from EMA at about 11:00 a.m. • Neither the EUB nor Acclaim contacted the City within the first 24 hours following the blowout. • Feel that Acclaim did not follow its ERP by failing to contact the City directly. • Feel that given the proximity of well to the City, the EUB should have contacted the appropriate City authorities in a more timely manner.
Parkland County	• Emergency Call Centre received a call from Acclaim at 8:25 a.m. and local authority notified through our 911 communications centre. • Centre notified key members of our Disaster Services team between 9:24 and 9:39 a.m. • Given the specific details of the incident, satisfied that notifications met our expectations.
Emergency Management Alberta	• The EMA Duty Manager was informed by the EUB through the CIC that an event was taking place mid-morning December 12. The incident was reported as a Level 1 only at that time. By mid-afternoon, the EMA Duty Manager was receiving conflicting reports with respect to the severity of the event but did not receive a change of status from the EUB. • As a result of the media reports, the EMA Director of Community Programs dispatched a First Nations District Officer to Enoch Cree Nation to determine the extent of the situation and provide support as required. Reports from the First Nations District Officer indicated that a major evacuation had taken place (up to 600 residents from Enoch), despite the fact that site H_2S readings were well below dangerous levels and reports that Acclaim staff were working in close proximity to the site without personal protective equipment. • On Monday, December 13, as the EMA Duty Manager responsibilities were handed over to EMA Acting Duty Manager, considerable effort was expended in getting accurate information on the status of the event. EMA was in contact with local authorities and the Capital Health Authority, providing what limited information existed at that time. • At about 9:00 a.m., December 13, team leader of the EUB contacted the EMA Acting Duty Manager to indicate that the event was moving to Level 3. A discussion ensued on the chronology of events, specifically when the event was determined to be Level 2, why EMA had not been notified of that fact, and what factors were driving the decision to move to a Level 3. It was also confirmed that there was no requirement for EMA operations centre assistance but that a local REOC would exist in St. Albert. The EMA Duty Manager did not conduct the traditional calldown at this time because all relevant stakeholders were already well aware of the situation and were attempting to determine what their roles would be. • Given that EMA assistance was not required, we indicated that EMA staff would not be present at the REOC but requested to be kept informed. The EMA Duty Manager's contact information was confirmed and EMA left an open offer for support should the situation worsen.
Enoch Cree Nation	• At 9:15 a.m. Parkland County Director of Disaster (DDS) called the acting director and identified the incident as low key and that a few people within a 1 km radius would be evacuated. • RCMP went into local church and announced the evacuation, while not identifying the radius; 600 people were evacuated. • Contacted by Acclaim at 11:30 a.m.
Environment Canada	• At 12:12 p.m. on December 12/04, Shift Supervisor MSC-Edmonton Weather office notified EC's 24-hour environmental and emergencies line with regard to numerous calls regarding a natural gas well fire on Enoch Reserve.

Environment Canada (cont.)	• At 2:00 p.m., the EC Duty officer, after numerous calls to find out what was happening, received a call from AENV dispatch providing information about the incident. • The notification did not meet EC's expectations with regard to the administrative agreement with AENV. Both the person receiving the initial phone notification from the EUB and the AENV on-call investigator failed to notify EC in a timely manner. • Due to communications breakdown, unable to meet EC enforcement commitment to advise EC's National Environmental Emergencies Centre and senior personnel within one hour. Exacerbated by proximity of release to federal Indian Reserve.
Health Canada	• Not directly notified of incident by any organization or agency directly involved with the incident; obtained details via media reports. • Lack of formal notification did not meet our expectations to enable us to meet the necessary public health risk communication with the Enoch Nation. • Once made aware of the situation, field staff dispatched to Enoch Reserve to gather information and communicate with the Health Centre.
Stoney Plain/Spruce Grove RCMP	• At 8:31 a.m. on December 12/04, the RCMP was notified of this incident by Parkland County 911 Call Centre. Notification did not contain adequate detail. RCMP Watch Commander contacted a contractor at the site to establish communication and gather additional information to make further notifications. • Contractor for Acclaim did not appear to be versed in Acclaim's ERP. • Notification included Edmonton Police, RCMP media liaison, Alberta Environment, Inland Highways, City of Edmonton Disaster Services, and others.
St. Albert Field Centre	• EUB notified in a timely manner and notified EMA as required. • Initial information received was sketchy and inaccurate to some degree and did not correlate with some of the actions and observations being taken, which caused confusion for everyone.
Workplace Health & Safety	• WH&S notified at 3:55 p.m. on December 12/04, by H&S Manager of Acclaim. • WH&S responded by having an officer attend the site to ensure compliance with OH&S code and legislation.

Question 3: Discuss your organization's need to have a representative(s) on site at 2-26. Describe your organization's on-site involvement and your communication with the Regional Emergency Operations Centre (REOC).	
Alberta Environment	• AENV staff on site to collect data from the MAML and forward to REOC. • All information regarding conditions at well site cleared through REOC. • AENV presence at well site, with the exception of the MAML, likely of limited benefit. • During the initial days at well site, AENV presence did provide a better contact for the department.
Alberta Health & Wellness	• No need to have representation at the well site. No involvement at the site.
Alberta Infrastructure and Transportation 24-hour on-call centre	• None.
Alberta Infrastructure and Transportation	• No response.
Capital Health Region	• Capital Health representatives should have been permitted to attend at 2-26. Such representation would enable the establishment of full communication and input into the information flowing to the REOC.
City of Edmonton	• The City was not required to have a representative at the well site.
Parkland County	• On-site involvement included our mobile command unit, fire fighting forces, and fire chief. • On-site involvement served two purposes, keeping open the lines of communication with the local authority and providing assistance as required. • Communication with the REOC was mostly one-way (receiving updates) and was established some time after the incident. Two-way communication was available as required or needed.

Emergency Management Alberta	• EMA has no need for a representative on site. EMA works directly with the affected municipalities through District Officer representation at municipally activated Emergency Operations Centres (EOC). Our communication with the REOC was effective but regular reports were not distributed until the fourth day of the event. Internally, the EMA District Officer at Enoch was providing 3 - 4 updates per day, keeping EMA staff informed on site and community activities.
Enoch Cree Nation	• Enoch Cree Nation did not have a role at the site. • Enoch had NO direct contact with the REOC.
Environment Canada	• Did not have an opportunity to have a representative at the well site or at REOC until well into mitigation of the incident. • EC did not have direct contact with the REOC. Received info as relayed through AENV. • Would have been useful to have an enforcement officer present at well site or at REOC in early stages of incident to provide first-hand information to National Environmental Emergency Centre (NEEC) and senior management that obligations under *Canadian Environmental Protection Act* (CEPA) 201 were being addressed.
Health Canada	• Organization does not necessarily have to be on site but important to have accurate information to determine potential impact and health risk to Enoch. • Involvement and communication with REOC was limited and majority of information was received second hand. • Section 3.21 of the UPISP identifies HC, First Nations, and Inuit Health Branch as agencies involved in the REOC. • These parties should be identified as possible participants in the REOC should the incident have the potential to impact First Nation communities. • HC was invited to the REOC on Dec 24/04 once our role was understood.
Stoney Plain/Spruce Grove RCMP	• RCMP's on-site involvement was restricted and minimal for reasons such as lack of appropriate safety equipment and training to deal with H_2S. • An on-site RCMP officer would have been beneficial to fully understand the scope of the problem and establish initial communication. • Most resources initially dedicated to road blocks and evacuations. • Communication with REOC was not established until the afternoon.
St. Albert Field Centre	• EUB had a rep on site 24/7 from the onset, except for a period during the first night. • Representation also reduced to a day shift after it was determined that further top kill procedures would not be continued and that capping the well would be dependent on relief well progress.
Workplace Health & Safety	• WH&S initially staffed the site 24/7 to determine if health and safety plans/procedures were in place to protect the workers. • WH&S identified many areas of concern and requested that Acclaim ensure that they were dealt with.

Question 4: Discuss your organization's need to have a representative(s) at the REOC. Describe your organization's involvement at the REOC and comment if it met your expectations. Please comment as to whether or not the functionally of the REOC met the expectations of the UPISP.	
Alberta Environment	• AENV presence at the REOC was vitally important. Staff obtained frequent updates, which were forwarded to various people within AENV. • Keeping updates current and flowing allowed AENV to deal with the many inquiries from the public and the media. • Staff at the REOC were available to Acclaim, EUB, and Health to answer questions or direct inquiries to the proper people. • AENV maintained one investigator at the REOC 24/7 and a compliance manager attended daily meetings as required until 12/23/04. From this date until conclusion, AENV staff were only present during update meetings.
Alberta Health & Wellness	• No need to have access or presence at the REOC.
Alberta Infrastructure and Transportation 24-hour on-call centre	• None.
Alberta Infrastructure and Transportation	• No response.

Capital Health Region	• Capital Health representation is essential as well at the REOC. The REOC in this case operated as "information sharing" vehicle, not as an operations centre, which would debate and strategize the response to the event. However, as time went on, more issues came forward to the table and the agencies had input into them.
City of Edmonton	• Given the proximity of the well to the City, that citizens of the City had been evacuated (without our knowledge), and that the main effects of the smell and smoke plume were over the city, it was imperative that the City be represented at the REOC. • Provided a liaison officer (Director of Emergency Preparedness) to the REOC to attend operational briefings. • REOC functioned well but its small size would have been a problem if more people had to attend. • If the incident had occurred within the City boundaries, the municipal emergency operations centre would have been activated and coordination activities would likely have occurred there, not at the EUB offices.
Parkland County	• Specific to this incident there was no need for the local authority to have a representative at the REOC. Our representative was on site.
Emergency Management Alberta	• EMA did not require representation at the REOC, as the EUB indicated that EMA support was not required. EMA believes the REOC was slow in initiating reports but that the reports were informative once distributed and the REOC was available and responsive to EMA requests for information.
Enoch Cree Nation	• Should have had a major role at the REOC because Enoch were directly involved in the incident and needed to receive information first hand to provide information to the community. • Enoch had NO involvement in the REOC. The organization structure in the event of an emergency and the Enoch's role is the same as a municipality's. There should have been a rep at the REOC. • The EMA-First Nation District Officer (FNDO) provides support to our communities but does not act on our behalf. • Recommend in the future that the EUB invite the First Nation to participate in the REOC.
Environment Canada	• Did not have an opportunity to have a representative at the well site or at REOC until well into mitigation of the incident. • EC did not have direct contact with the REOC. Received information as relayed through AENV. • Would have been useful to have had an enforcement officer present at well site or at REOC in early stages of incident to provide first-hand information to NEEC and senior management that obligations under CEPA 201 were being addressed.
Health Canada	• Not being notified and not being actively involved in the REOC does not meet our expectations and hinders HC from fulfilling its mandate to First Nations communities.
Stoney Plain/Spruce Grove RCMP	• RCMP not represented at REOC. Therefore it's not possible to comment further on our agency's expectations. • The RCMP was not invited to be in attendance at the REOC. A well blowout of this level in proximity to a populated area made initial RCMP representation at REOC very important.
St. Albert Field Centre	• EUB established the REOC and manned the facility throughout the incident, 24/7 initially and reduced during the period when capping was dependent on relief well progress. EUB provided the REOC with a commander or an assistant, two support staff during the day and one during the night shift, a coordinator during the day shift, and technical support as required during the incident. • Functionally of REOC met the intended purpose: to provide a one window for sharing information and addressing issues raised by the government family of agencies. • This type of incident is a major drain on Field Centre resources required to staff the REOC, have a presence on site, and accommodate air monitoring needs. • The provincial plan has to be more specific on agency manpower commitments and the agencies must agree they can meet those commitments for the plan to be effective.
Workplace Health & Safety	• WH&S decided not to have a representative at REOC. Needs to hear and participate in discussions that may affect workers on site. • Needs to be available to workers that have a concerns about a hazard and are not comfortable addressing it with employers.

Question 5: Describe the gathering and dissemination of information and communication (e.g., meetings, minutes, REOC updates) established through the REOC. Please comment with respect to your organization's ability to keep senior management and/or government officials fully informed about the incident.	
Alberta Environment	• REOC meetings were regularly scheduled, timely and provided information as required to advise senior management. Minutes of the meetings were forwarded in a timely fashion and were very useful in preparing management updates.
Alberta Health & Wellness	• Once we were identified as a contact, the information received was helpful and required to keep our respective organizations informed.
Alberta Infrastructure and Transportation 24-hour on-call centre	• Information initially was slow to come back to the call centre and there was difficulty keeping senior management briefed. Following communications with EMA staff, the situation was rectified by adding the call centre staff to the situation report distribution list. • Training has been scheduled in February for all staff to enable them to access EMA's incident tracking logs to provide for better information sharing.
Alberta Infrastructure and Transportation	• No response.
Capital Health Region	• There is a critical need to follow official emergency response plans and therefore a critical need to exercise them. Exercising plans reduces the level of confusion that can accompany any emergency situation. As previously mentioned, communications improved over the time of the event. Once the confusion of the first day was overcome, the information flow improved and Capital Health was able to ensure its management was informed of the progress of the event. The need for exercises was also evident in the actions of the various stakeholders in contacting other government agencies on the periphery of the event for infrastructure information, some of which would have been more appropriate for REOC discussion. Exercises would help clarify the role of all agencies in public safety in Alberta, including Alberta Health, Emergency Management Alberta, and adjacent municipalities, among others. As well, they would yield insight into the roles of senior management of the various agencies and requirements for critical resources.
City of Edmonton	• The information provided at the daily briefings was excellent. This provided a good basis from which to brief senior municipal officials.
Parkland County	• The information and communication from the REOC was accurate and timely. This information played an integral part in maintaining the lines of communication to senior management and government officials.
Emergency Management Alberta	• In EMA's estimation, the EUB should have been distributing updates as soon as the event reached Level 2 or higher. Once the reports were distributed, EMA was pleased with the information and, as previously stated, pleased with the responsiveness to questions. EMA also had a direct source for information through Enoch's contact with the operator. It must be stressed at this point that information coming from the two sources was generally consistent, with the exception of detailed evacuee numbers. This is a reflection of the accurate information collated and distributed by the REOC. EMA was therefore able to keep senior management, communications staff, and federal authorities informed on the incident.
Enoch Cree Nation	• Received our information directly from Acclaim and our EMA-FNDO. We received NO information from the REOC. • Our ability to keep our officials updated was solely from Acclaim. • Acclaim's direct commitment to keep us updated, attending meetings when requested, and providing us with the information and support needed was outstanding.
Environment Canada	• From EC's peripheral involvement, it appeared that the REOC operated very well. • Once on the e-mail list, EC received timely and informative updates regarding the progress of incident mitigation. This was helpful in keeping NEEC and senior management informed of the progress at the site.
Health Canada	• HC was able to keep somewhat informed about the incident via obtaining REOC updates and the like from second-hand methods, i.e., Indian and Northern Affairs Canada (INAC), Capital Health, and the general media.
Stoney Plain/Spruce Grove RCMP	• REOC did not include the RCMP in updates until specifically asked to do so. REOC updates were useful when this agency was put online. • The RCMP has a fully functional system to keep its senior management updated.

St. Albert Field Centre	• Information gathering and dissemination were orderly and met the expectations of the organization, except for maybe the first day, when information requests prevented staff at the REOC from expeditious establishment of the logistics requirements. • Management at the EUB and within all government families were kept well informed and had input to address any and all issues. • Survey conducted midway through incident provided positive and constructive feedback to improve process. • Participation by those at REOC was very valuable and ensured that all issues were addressed. Inputs allowed issues to be addressed quickly.
Workplace Health & Safety	• WH&S senior management were kept informed by the on-site officers. This can, and was, done on a daily basis at first and less frequently as control of the well improved.

Question 6: Describe your organization's views of the overall operations at the REOC. Please comment on the facility, accessibility, equipment (e.g., fax, photocopier) support, administrative staff, meeting arrangements, information documentation (e.g., flip charts, amps), hours of operation, cell phone coverage, meals, security, and the like.	
Alberta Environment	• The REOC was set up in the EUB St. Albert office. The room provided proved to be too small to accommodate all parties involved in the updates/meetings. • Meeting arrangements and administrative assistance appeared adequate. • Definite shortage of computer hookups. • Security, meals, and accessibility did not raise any concerns with AENV staff.
Alberta Health & Wellness	• We were not present at the REOC and therefore cannot comment.
Alberta Infrastructure and Transportation 24-hour on-call centre	• Not applicable.
Alberta Infrastructure and Transportation	• Not applicable.
Capital Health Region	• The facilities for the REOC were suitable for the most part. The availability of information updates, faxing equipment, meals, and support staff was excellent. • The facility did not meet UPISP requirements for communications and was crowded when information sessions were given. A larger room would preclude the need for private sessions and allow full participation of the representatives.
City of Edmonton	• While the REOC functioned well under the circumstances, had the situation been more serious it is doubtful it would have been adequate.
Parkland County	• As no representative from the local authority was in attendance at the REOC, we have no comment to this question.
Emergency Management Alberta	• No comment, as EMA was not a REOC participant.
Enoch Cree Nation	• Enoch Cree Nation is unable to comment, as we were not involved in the REOC.
Environment Canada	• EC cannot comment on the effectiveness of the facility and operations at the REOC other than as stated in question 5 and to note that when EC enforcement staff did attend the REOC on one occasion, the room was cramped for the number of people present.
Health Canada	• From our limited involvement with REOC, the general impression was that the operation was adequate.
Stoney Plain/Spruce Grove RCMP	• Not applicable.
St. Albert Field Centre	• From all accounts, the facility, associated equipment, administrative and logistic support, meeting arrangements, hospitality, and reporting met or exceeded expectations for an incident that lasted as long as this and that saw the dynamics of the REOC change as participation and hours of operation were reduced. • REOC was notably crowded during two update meetings, but everyone was able to have input, visual aids were accessible to all, hearing was not difficult, and it gave visitors the sense of being completely immersed in the war. • A bigger facility might have been beneficial for several meetings, but from a logistics point of view that would have made day-to-day operations more difficult.
Workplace Health & Safety	• Perhaps future discussions on how to bring regulatory information from different agencies together in a common place or format.

Question 7: Comment as to whether or not your organization believes other responders should have been represented at the REOC.	
Alberta Environment	• Other parties that should have been included were the RCMP and Enoch Band—the RCMP initially to update on the evacuation and the Enoch Band so progress reports would get back to reserve residents.
Alberta Health & Wellness	• The RHA should have been .contacted as early as possible and thereafter to determine the need for their attendance at the REOC.
Alberta Infrastructure and Transportation 24-hour on-call centre	• Not applicable.
Alberta Infrastructure and Transportation	• Not applicable.
Capital Health Region	• The absence of the municipality public safety representatives was a problem. THE UPISP identifies the representation required and in this case was not met for whatever the reason. All parties should participate.
City of Edmonton	• The absence of EMA and Parkland County from the REOC was noted.
Parkland County	• As no representative from the local authority was in attendance at the REOC, we have no comment on this question.
Emergency Management Alberta	• No comment, as this event did not reach the level where coordination of government-wide resources was required and therefore EUB chose not to employ EMA staff or resources.
Enoch Cree Nation	• Once again, Enoch cannot comment, as we do not know who was involved in the REOC.
Environment Canada	• EC has no comment in this regard other than that it may have been useful to invite a representative from INAC or HC to be present if there were any concerns on the part of residents of the reserve. This may have occurred.
Health Canada	• Health Canada should have been represented at the REOC from the start.
Stoney Plain/Spruce Grove RCMP	• Not applicable. See response to question 4.
St. Albert Field Centre	• The EUB believes that other responders as identified in the UPISP should have participated and would have been an asset to have at the REOC. • Notably missing were Parkland County, Alberta Infrastructure and Transportation (issues raised with fluid and waste trucking), RCMP(evacuation), HC(not clearly identified in the plan), EMA (expertise with logistics), and Enoch Cree Nation (not identified in plan but learned later on that they should be treated as a municipality).
Workplace Health & Safety	• Unable to comment.

Question 8: Please feel free to add additional comments.	
Alberta Environment	• Initial reporting and classification of this event caused confusion within AENV. Once it became clear what the issues were, our obligations became clear and we were able to meet them quickly. • Areas of improvement include clearer reporting guidelines, more accurate information in initial reports, and a REOC capable of coping with a large number of attendees at meetings. • During the event several mobile H_2S and SO_2 monitoring vehicles were in the vicinity of the blowout. Traditionally, in these types of situations, AENV audits the accuracy of the monitoring equipment. The EUB was very reluctant to cooperate with AENV staff on these routine audits of EUB equipment. • On the positive side, once the confusion was cleared up, information received from the EUB and Acclaim was timely and useful. Once the REOC was established and manned up, it served to organize all players and provide a focal point for information gathering and dissemination. Cooperation between the EUB and Acclaim and AENV was good and allowed AENV to meet its mandate with minimum difficulty.
Alberta Health & Wellness	• We feel that the process needs to distinguish between stakeholders and public communications. Stakeholders must be fully informed regardless of the perceived level of threat. • The respective ministers of other government departments, in this case Alberta Health & Wellness, needs to be assured that public health issues are being accurately addressed and communicated. RHAs need to be engaged as early as possible so that they have the required information to communicate on public health matters.

Alberta Infrastructure and Transportation 24-hour on-call centre	• No comments.
Alberta Infrastructure and Transportation	• Agreed to use a great deal of discretion when monitoring the weights of the vehicles hauling material from the site to a disposal site by Settler. • Some of the carriers involved began to load to and over the additional weight allowed; detected several very significant overloads. • Some carriers began to haul to other sites other than original agreement. E-mail had been sent to Acclaim advising them to provide any additional routes, but no response was received. • Greatest concern was that Acclaim seemed to very quickly lose effective control over the loads leaving the site from both the weight and routing perspective. • Second concern was about the lack of communication from the Acclaim representative. Had communication with Acclaim occurred, Alberta Infrastructure and Transportation could have regained an acceptable level of control at the site, as opposed to detecting the overloads on the roads. • In the future site management must be more accessible when there is such an incident to ensure that the company can deal with those types of concerns before the loads access the highway system.
Capital Health Region	• No comments.
City of Edmonton	• The City of Edmonton remains concerned as to why such a large area was evacuated when the advertised EPZ was so small. As has been requested in separate correspondence, we have asked whether or not the EPZ was accurate or if the subsequent evacuation was excessive.
Parkland County	• No comments.
Emergency Management Alberta	EMA's primary concerns are threefold: • the need to ensure that EMA is notified when an event changes from one level to another, in this case from a Level 1 event to Level 2 or higher; • the need for the REOC to distribute summary reports early in the process; and • the need to update the UPISP with the appropriate authority as the lead. EMA is prepared to coordinate the UPISP review and update effort.
Enoch Cree Nation	• Enoch Cree Nation recommends that the EUB consider all First Nations equal partners and recognize that our roles are equal to that of a municipality. • Should there be a debriefing of all the stakeholders, Enoch Cree Nation would like to have a representative present. • Enoch Cree Nation wants to acknowledge the remarkable working relationship Acclaim maintained with us during the event. Their commitment and dedication were greatly appreciated by our community and leadership
Environment Canada	• No comments.
Health Canada	• The UPISP and *Directive 71* are not consistent in terms of agencies being consulted and notified of emergency situations. Under Section 2.2.2.2 of *Directive 71*, Environmental Health Services, Health Canada, First Nation and Inuit Health Branch, is specifically identified as an agency for consultation in ERPs and emergency situations; this is not the case in the UPISP. As indicated in the response to question 1, HC is not identified as an agency requiring notification in the UPISP. • Well classification is also an issue. Wells with the classification of E are only required to have a corporate ERP and therefore there is no requirement for the exploration company to provide an updated or revised ERP, with appropriate contact information, in consultation with the health authority or HC. • There is little or no accountability to ensure that the exploration companies are consulting or notifying the appropriate health authorities during the development of an ERP or when commencing activities in a region, as specified in Section 2.2.2.2 of *Directive 71*. According to EUB staff, they do not verify that adequate consultation or notification of the appropriate health authorities occurs by the exploration companies. This issue was brought forward at an EUB information session held in Edmonton in early December 2004, but to date, there has been no correspondence from the EUB exploring any potential remedies to this situation. • HC acknowledges that the risk of serious upstream oil and gas incidents is low. However, as evident in the case of the Acclaim

Health Canada (cont.)	incident, there is a potential for immediate and serious health effects when an emergency incident does occur, especially when in close proximity to a high density area. It is therefore suggested that a review of the minimum setback distances with relation to public facilities and high density locations may be prudent. This would serve to reduce the potential for large-scale health risks posed by upstream oil and gas incidents.
Stoney Plain/Spruce Grove RCMP	On Dec 13/04 at 11:10 p.m. this detachment was notified of a fire at the 2-26 site by an off-duty member of the RCMP media services. He had learned of the fire through live television broadcasts. No notification of the fire or resulting injuries was received unsolicited from REOC. No unsolicited notifications were received from Acclaim. Recommendations: • Any contractor for an upstream operator be fully versed in its obligations in an emergency/disaster. • If an upstream operator is conducting operations with risk, such as reactivating sour gas wells with corrosive substances, in the near vicinity of communities, the upstream operator notify all emergency responders in the area. • An RCMP member be include as a chair sitting member of a REOC in all Level 3 events. • REOC include all law enforcement and quasi-law enforcement units and emergency first responders in its regime of notifications and updates, specifically Parkland County Patrol, RCMP Enoch Satellite Detachment, and Enoch Tribal Special Constables. • Timelines of effective communications be established sooner with stakeholders and affected communities, specifically with Enoch Cree First Nation and the Enoch Tribal Special Constables. • A full and formal debriefing be held with all the participants and first responders to this incident.
St. Albert Field Centre	Internal Observations • Media communications through the REOC were not well coordinated in the early stages and could be improved for future incidents. It is suggested that initially two communication staff be assigned to these types of incidents. One staff could remain at the REOC, while the other attends press conferences and media scrums.
Workplace Health & Safety	• The working relationship and communication aspects between the regulatory officers attending the On-Site Command Centre were very good. Perhaps future discussions on how to bring regulatory information from different agencies together in a common place or format.

Appendix 10 Letter Drop Program Letter

ACCLAIM

Dear Resident

As you are aware, on Sunday, December 12, Acclaim Energy Inc., the operating subsidiary of Acclaim Energy Trust, activated its emergency response plan at our Acheson location due to an H_2S (Hydrogen Sulfide) gas leak. The leak occurred doing a routine work over that is regularly performed on oil and gas wells to enhance or return the well to production.

The Alberta Energy and Utilities Board (EUB) was called to the site immediately, and initially graded the situation a "Level 1", the regulatory body's lowest level for incidents.

Our first priority was and continues to be, for the safety and comfort of the public, our employees and our contractors. There were no injuries as a result of the H_2S gas release. While it was deemed that there was no health risk, residents in the area were informed of the incident and as a precautionary measure, anyone living within one kilometer (km) of the site was evacuated to a safe location by the RCMP. Approximately 700 people were relocated to Edmonton area hotels at Acclaim's expense.

In the early hours, our staff worked diligently to assemble an on-site emergency response team and initiate the corporate Emergency Response Plan which brought a number of experts to the site, including well service and control specialist Safety Boss. They immediately began work to stop the uncontrolled flow of gas. The Acclaim Energy Emergency team on-site and in Calgary has been working with government agencies and organizations such as the Parkland County EMS, Alberta Energy Utilities Board (EUB), Alberta Environment, Capital Health Region and the RCMP from the beginning.

Air quality and wind monitoring was set up in a number of locations from one-half to three kilometers away from the wellhead. On Wednesday, December 15th, Acclaim increased the number of air monitors taking air quality measurements in the surrounding to a total of 14. Their readings indicate an extremely low potential threat to public health and safety, as H_2S levels have averaged from 0.0 to 0.005 parts per million during the day. Ten parts per million is the occupational limit allowable for eight hours of exposure to H_2S.

Late Monday evening, while working to stop the flow of gas, static electricity caused a spark which ignited the well. Two Safety Boss employees were treated for minor burn injuries and returned to work the next morning. The fire essentially burned off the H_2S leaking from the well with air monitoring reporting negligible levels of 0.0 to 0.030 parts per million.

The fire was successfully extinguished at 7:00 pm. on Tuesday, December 14th. Putting out the fire was necessary to inspect the condition of the wellhead and to decide what our options were to bring the well under control. On Wednesday, December 15, Acclaim began spraying water on the well as a means of dealing with community concerns around the odor. This is a common practice, as the water acts as a scrubber which effectively minimizes the smell associated with H_2S.

On Wednesday evening the Acclaim Emergency Response team met with representatives of the EUB, Alberta Environment, the City of Edmonton and Capital Health Region to assess the

best options for continued efforts to cap the leak and shut down the well. After thorough discussions and a technical review, it was agreed that the well be ignited and allowed to burn while a new well is drilled. The controlled ignition of the well provides the safest conditions for workers onsite and residents living on and in the vicinity of the lease land. The alternative would mean allowing H_2S to accumulate in low lying areas at the well site where it has the potential to spark and ignite spontaneously.

Crews have begun preparing the site for two possible drilling locations on the lease land. The first drilling will begin as soon as the rig is on-site, and the second drilling will begin a couple of days later. If the first well successfully connects to the existing well, the second well will not be completed. However, if the initial effort does not succeed, the second well will be well under way. This process could take as long as two weeks.

Initially the situation displaced many families. On Tuesday, December 14th, all but approximately 30 families returned to their homes. On Wednesday, December 15th, Acclaim evaluated the evacuation zone within the 1 km radius of the well-head and identified negligible traces of H_2S in the SW quadrant. As a result, approximately 24 families could choose to return to their homes at any time.

There are a handful of families that live in close proximity to the well site, that are expected to remain in alternate accommodation. This is not a safety issue, but rather they would be disrupted by the bright lights and noise associated with the operation. Acclaim is committed to ensuring the comfort and safety of these residents during this stressful time.

We are working closely with Alberta Energy Utilities Board; Enoch Cree First Nation; Parkland County; Alberta Environment; Alberta Occupational Health and Safety; the RCMP and landowners in the surrounding area.

We recognize that you have experienced the unpleasant odor associated with H_2S emissions. While the odor is unpleasant, there is no health risk to you or your family. You should notice a significant diminishing of the odor while the well is burning. If you have any health related questions, I encourage you to call the Capital Health Region 24-hour health information line at 780-408-5465.

Since Sunday, a team of experts have been working around the clock at the site to bring an end to this situation safely and as quickly as possible. We will keep you apprised of the situation, but if you have any questions you may call the EUB St. Albert Field Centre at 780-460-3800 for incident information or visit our website at www.acclaimtrust.com.

The cause of the release and the extent of the damage are still unknown at this time, however we will conduct a Post Incident Investigation to determine the root cause(s) as soon as the well has been brought under control. Acclaim Energy, along with the EUB are required to table a comprehensive report on this incident.

We apologize for any inconvenience or discomfort this incident has caused you and your family.

Sincerely,

J. Paul Charron
President & CEO

Greg Hayduk
Production Superintendent

Appendix 11 Results of EUB Inspection of Acclaim Facilities, January 2004 — June 30, 2005

2004 Acclaim Compliance Summary, January 1 to December 31, 2004

Drilling Inspections (EUB *Directive 36*)

Inspection result	Inspections of Acclaim	Acclaim compliance rate (%)	Inspections of industry	Industry compliance rate (%)
Satisfactory	7	100%	446	84.5%
Minor unsatisfactory	0	N/A	56	10.6%
Major unsatisfactory	0	N/A	25	4.7%
Serious unsatisfactory	0	N/A	1	0.2%
Total	**7**	**N/A**	**528**	**N/A**

Well Service Inspections (EUB *Guide 37*)

Inspection result	Inspections of Acclaim	Acclaim compliance rate (%)	Inspections of industry	Industry compliance rate (%)
Satisfactory	5	83.3%	293	88%
Minor unsatisfactory	0	N/A	31	9.3%
Major unsatisfactory	1	16.7%	9	2.7%
Serious unsatisfactory	0	N/A	0	N/A
Total	**6**	**N/A**	**333**	**N/A**

Well Site Inspections (EUB *Guide 64*)

Inspection result	Inspections of Acclaim	Acclaim compliance rate (%)	Inspections of industry	Industry compliance rate (%)
Satisfactory	67	78.8%	3939	74.8%
Minor unsatisfactory	17	20%	1283	24.4%
Major unsatisfactory	1	1.2%	44	0.8%
Serious unsatisfactory	0	N/A	0	N/A
Total	**85**	**N/A**	**5266**	**N/A**

Gas Facilities Inspections (EUB *Guide 64*)

Inspection result	Inspections of Acclaim	Acclaim compliance rate (%)	Inspections of industry	Industry compliance rate (%)
Satisfactory	50	83.3%	2114	73.5%
Minor unsatisfactory	9	15%	740	25.7%
Major unsatisfactory	1	1.7%	22	0.8%
Serious unsatisfactory	0	N/A	0	N/A
Total	**60**	**N/A**	**2876**	**N/A**

Oil Facilities Inspections (EUB *Guide 64*)

Inspection result	Inspections of Acclaim	Acclaim compliance rate (%)	Inspections of industry	Industry compliance rate (%)
Satisfactory	48	78.7%	2977	76.4%
Minor unsatisfactory	12	19.7%	873	22.4%
Major unsatisfactory	1	1.6%	45	1.2%
Serious unsatisfactory	0	N/A	0	N/A
Total	**61**	**N/A**	**3895**	**N/A**

Pipeline Inspections (EUB *Guide 66*)

Inspection result	Inspections of Acclaim	Acclaim compliance rate (%)	Inspections of industry	Industry compliance rate (%)
Satisfactory	13	86.6%	1272	83.5%
Minor unsatisfactory	1	6.7%	136	8.9%
Major unsatisfactory	1	6.7%	115	7.5%
Serious unsatisfactory	0	N/A	1	0.1%
Total	**15**	**N/A**	**1524**	**N/A**

2005 Acclaim Compliance Summary, January 1 to June 30, 2005

Drilling Inspections (EUB *Guide 36*)

Inspection result	Inspections of Acclaim	Acclaim compliance rate (%)	Inspections of industry	Industry compliance rate (%)
Satisfactory	1	100%	181	64.4%
Minor unsatisfactory	0	N/A	82	29.2%
Major unsatisfactory	0	N/A	18	6.4%
Serious unsatisfactory	0	N/A	0	N/A
Total	**1**	**N/A**	**281**	**N/A**

Well Service Inspections (EUB *Guide 37*)

Inspection result	Inspections of Acclaim	Acclaim compliance rate (%)	Inspections of industry	Industry compliance rate (%)
Satisfactory	0	N/A	102	86.4%
Minor unsatisfactory	1	100%	15	12.7%
Major unsatisfactory	0	N/A	1	0.9%
Serious unsatisfactory	0	N/A	0	N/A
Total	**1**	**N/A**	**118**	**N/A**

Well Site Inspections (EUB *Guide 64*)

Inspection result	Inspections of Acclaim	Acclaim compliance rate (%)	Inspections of industry	Industry compliance rate (%)
Satisfactory	35	79.5%	2392	76.9%
Minor unsatisfactory	9	20.5%	698	22.5%
Major unsatisfactory	0	N/A	18	0.6%
Serious unsatisfactory	0	N/A	0	N/A
Total	**44**	**N/A**	**3108**	**N/A**

Gas Facilities Inspections (EUB *Guide 64*)

Inspection result	Inspections of Acclaim	Acclaim compliance rate (%)	Inspections of industry	Industry compliance rate (%)
Satisfactory	25	86.2%	1359	73.3%
Minor unsatisfactory	4	13.8%	476	25.7%
Major unsatisfactory	0	N/A	20	1.0%
Serious unsatisfactory	0	N/A	0	N/A
Total	**29**	**N/A**	**1855**	**N/A**

Oil Facilities Inspections (EUB *Guide 64*)

Inspection result	Inspections of Acclaim	Acclaim compliance rate (%)	Inspections of industry	Industry compliance rate (%)
Satisfactory	10	83.3%	1387	73.9%
Minor unsatisfactory	2	16.7%	457	24.4%
Major unsatisfactory	0	N/A	32	1.7%
Serious unsatisfactory	0	N/A	0	N/A
Total	**12**	**N/A**	**1876**	**N/A**

Pipeline Inspections (EUB *Guide 66*)

Inspection result	Inspections of Acclaim	Acclaim compliance rate (%)	Inspections of industry	Industry compliance rate (%)
Satisfactory	9	90%	572	79.2%
Minor unsatisfactory	1	10%	88	12.2%
Major unsatisfactory	0	N/A	62	8.6%
Serious unsatisfactory	0	N/A	0	N/A
Total	**10**	**N/A**	**722**	**N/A**

Appendix 12 Recommended Practices for Communication During Incidents

1) Industry should meet with and establish good working relationships with communities near sour gas development.

2) The use of letter-drop programs should be considered in future incidents. Communication with affected communities would be further enhanced by multiple letter drops, particularly if the duration of the event exceeds one week.

3) Public complaints coming into the REOC and then distributed to the appropriate response group (Capital Health, EUB, AENV, or Acclaim) should be tracked and handled through REOC meeting minutes for future incidents.

4) Industry should consider contracting public relations specialists to assist with communications activities during future incidents if the licensee does not have sufficient resources within its own operations.

5) Web sites should be used in future similar situations to assist with communication, provided that all parties consistently brief the REOC before new information is posted.

6) REOC updates should be sent out as soon as possible (3-5 hours) after the REOC is activated. An accurate and complete stakeholder list should also be established as early as possible.

7) Accurate information must be provided to EUB Communications staff at all stages by identifying reliable information sources at the EUB, the responding company, and all government agencies. This information should be kept at the REOC and updated as required.

8) All participants in REOC should submit any information being submitted to the public to all REOC participants for approval prior to release to ensure accuracy and consistency.

Appendix 13 Reservoir Matters and Calculation of the Emergency Planning Zone

Pool Depletion Strategy

The Acheson Leduc A pool, in which the 2-26 well was completed, was discovered in 1951 and put on production shortly thereafter. The pool has been depleted through primary production, the implementation of water injection in 1957, solvent injection (1987-1990), and gas injection (1988-present). The pool depletion strategy had been to maintain a minimum operating pressure of 8500 kPa to maximize oil recovery.

Pressure was maintained in the pool through the injection of water into the aquifer below the oil pool and injection of gas into the gas cap above the oil. This pool depletion strategy resulted in the oil being swept from the bottom and top into a thin oil section sandwiched between the aquifer and the gas cap. As the pool was depleted, the oil zone became thinner and the wells began to produce more water. To correct this situation, the wells were recompleted (reperforated) in the oil section of the pool to restore oil production rates. Such a recompletion was the purpose of the workover being performed on the 2-26 well when the blowout occurred.

Conservation of Energy Resources

Acclaim submitted estimates of the volumes of salt water, gas, and oil that were released during the blowout. While the EUB has a conservation mandate to prevent waste, the investigation team believes that the hydrocarbon volumes released and wasted were relatively minor, compared to the volumes produced from 2-26 over its lifespan. As usual, the key issues of public safety and environment protection overshadowed conservation matters.

Calculation of the Emergency Planning Zone

The emergency planning zone (EPZ) for a sour well is usually a circular area centred on the well and having a radius calculated from the following equations:

$$H_2S_{rr} = H_2S\% * AOF * 0.01/86400$$

Where H_2S_{rr} = H_2S release rate in m^3/s,

$H_2S\%$ = percentage of H_2S in the gas phase,

AOF = absolute open flow potential (for a gas well) in m^3/day, and

86400 = the number of seconds in one day

In the case of the 2-26 well, Acclaim estimated the AOF to be 343.6 thousand m^3/d, based on production data available from the pool due to the lack of any significant inflow performance ratio data for the pool. The investigation team has reviewed the production records and believes that this is a reasonable estimate.

At the time of the blowout, the available H_2S concentration data for the general area of the 2-26 well indicated that a value of 0.56 per cent (5600 ppm) should be used for a worst-case EPZ calculation. The following is an EPZ calculation using the AOF and H_2S concentration mentioned above.

$$H_2S_m = H_2S\% * AOF * 0.01/86400$$

$$= 0.56 * 343.6 * 10^3 * 0.01/86400$$

$$= 0.0223 \text{ m}^3/\text{s}$$

When H_2S_m is less than 0.3 m^3/s,

$$EPZ = 2.0 * (H_2S_m)^{0.58}$$

$$= 2.0 * (0.0223)^{0.58}$$

$$= 0.22 \text{ km}$$

The results show that Acclaim should have employed an EPZ of 0.22 km (220 m) on December 12, 2004. Instead, it calculated an EPZ of 0.043 km (42.8 m) using an H_2S concentration of 0.0370 per cent (370 ppm). Acclaim has been unable to supply documentation to support this H_2S value. It is important to note that there are no residences or other surface developments within the 220 m radius of the 2-26 well.

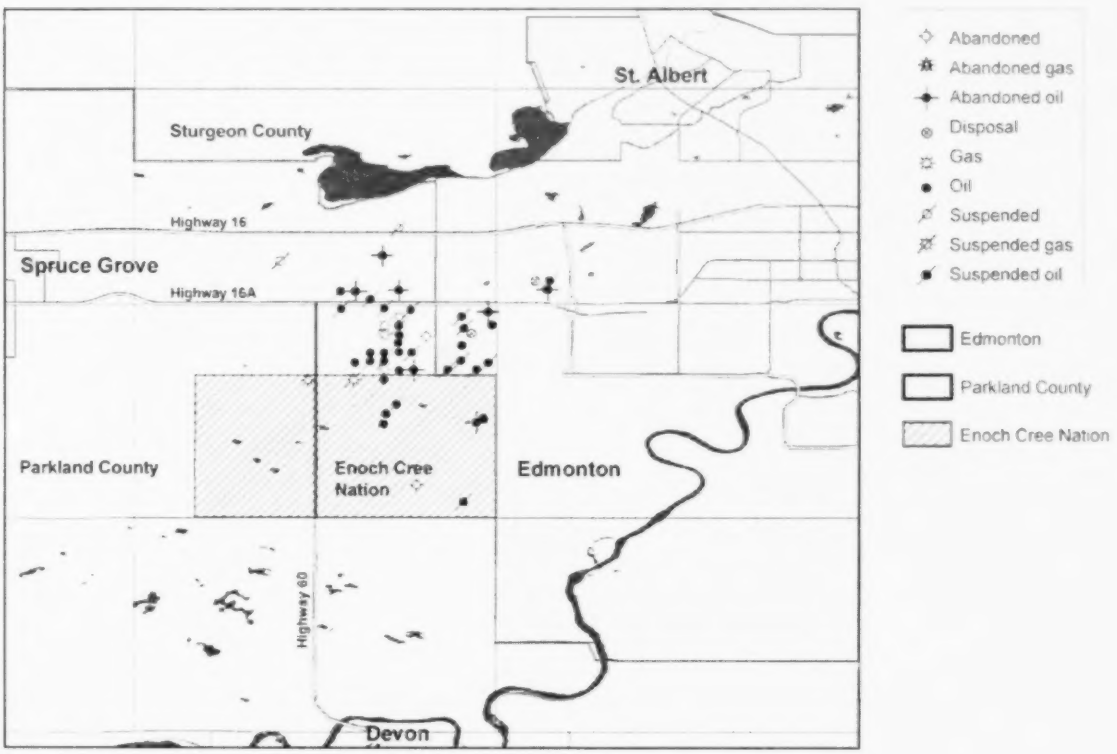
Acclaim completed a gas analysis on January 20, 2005, that showed that the H_2S concentration for the 2-26 well was 0.0225 per cent (225 ppm). Had this value been available prior to the commencement of the 2-26 well workover, the EPZ calculated for the well would have been only about 34 m. Since this H_2S value was not available then, it was necessary to use the best available value derived from data for the area, 0.56 per cent.

Appendix 14 Acheson and Acheson East Suspended Wells

Background

The investigation team completed an audit of the suspended wells in the Acheson and Acheson East Fields, which are located in Parkland County and Edmonton (see map below).

The 2-26 well ceased production in January 2003, requiring that it be suspended in accordance with *Interim Directive (ID) 90-4: Suspension Guidelines for Suspended Wells* by January 2004. The 2-26 well was classified as a Class B well (sweet or low H_2S surface killable gas well). *ID 90-4* requires that the licensee of a Class B well conduct periodic inspections to ensure wellhead security and to provide casing corrosion mitigation. Although not required, the 2-26 well was shut in and suspended with a packer and tubing, which provided isolation of the well casing from the producing formation (Leduc) exceeding the requirements of *ID 90-4*.



Suspended wells in Acheson and Acheson East Fields

ID 90-4 was coincidentally undergoing regulatory review during 2004 and was replaced by *Directive 013: Suspension Requirements for Wells*, on December 1, 2004. This change had no impact on the suspension requirements for the 2-26 well. *Directive 013* reduced the number of risk categories from five to three and added a stringent reporting

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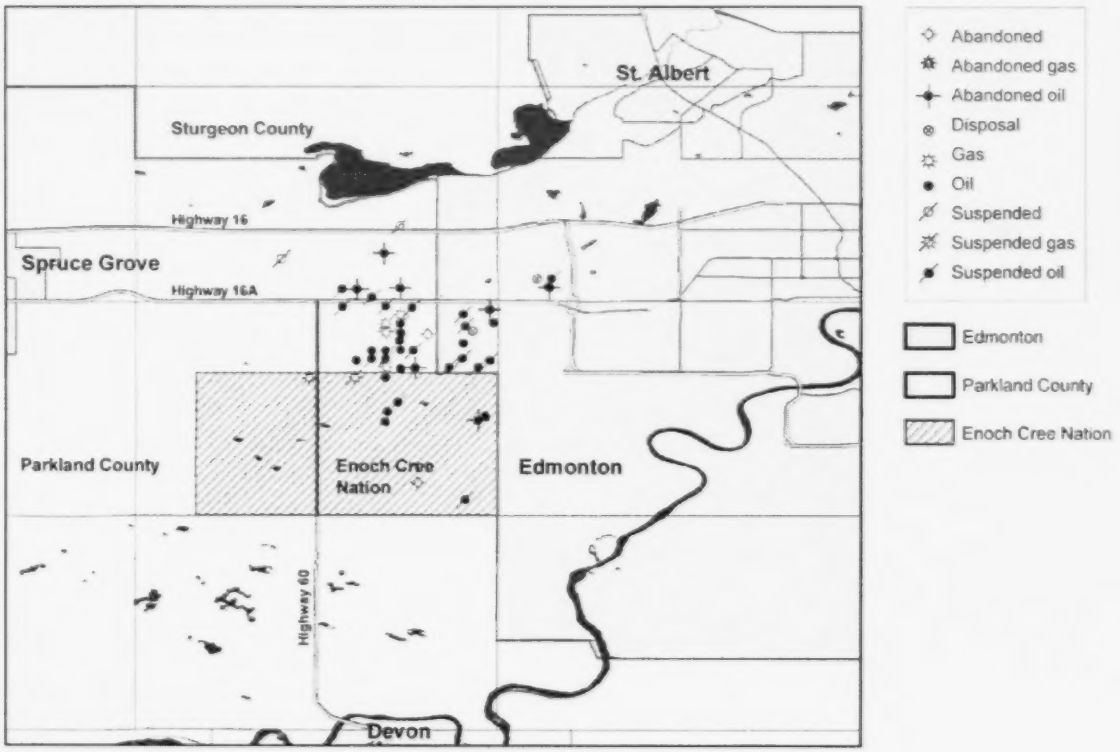

Suspended wells in Acheson and Acheson East Fields

ID 90-4 was coincidentally undergoing regulatory review during 2004 and was replaced by *Directive 013: Suspension Requirements for Wells*, on December 1, 2004. This change had no impact on the suspension requirements for the 2-26 well. *Directive 013* reduced the number of risk categories from five to three and added a stringent reporting

requirement for all suspended wells. Licensees are required to report all well suspensions to the EUB and keep a record of well inspections, test results, and other suspension details until well abandonment.

The 2-26 well is classified as a low risk well, according to *Directive 013*. A well is considered low risk if the flow rate is less than 28 000 m^3/day and the H_2S concentration is such that it would not result in a concentration of 10 ppm (0.001 per cent) of H_2S at a typical lease edge 50 m from the wellhead under worst-case conditions.

Suspension Audit

The investigation team evaluated the level of compliance with the requirements of *Directive 013* of all suspended wells in the Acheson and Acheson East Fields. The team requested suspension data from the licensees, as described in the Audit and Enforcement Process in *Directive 013*. The review also included EUB field inspections of all of the suspended wells conducted by the St. Albert Field Centre. The field inspections were performed to validate the licensees' data and results submitted.

The suspension audit included a review of the

- current wellbore configuration for each well,
- H_2S analysis,
- wellhead/wellbore pressure testing results,
- wellbore fluid composition,
- surface casing vent flow evaluation,
- wellhead security, and
- risk categorization and classification in accordance with *Directive 013*.

Acclaim is the licensee of 49 of the 54 suspended wells in the Acheson and Acheson East Fields. There are 591 wells in the Acheson and Acheson East Fields, including 54 suspended, 181 producing, and 356 abandoned wells. Ninety per cent of the suspended wells in this area are more than 20 years old. The median age of the wells in these fields is 52 years.

Audit Results

All 54 wells were categorized by the licensees as low risk according to the risk criteria set out in *Directive 013*, a result with which the investigation team agrees.

Most of the wells are unable to flow without artificial lift, which is the use of mechanical methods such as pumps for lifting the fluids to surface as a result of decreased reservoir pressure. This condition combined with the highest H_2S content results in the well being classified as low risk in accordance with *Directive 013*. The directive has no prescriptive downhole configuration for low risk wells, but there are requirements such as wellhead security, pressure integrity of wellheads, and the requirement for licensees to perform periodic well inspections. Additionally, wells suspended for 10 years or longer must be suspended according to medium risk criteria.

The maximum H_2S concentration reported by the licensees was 1.2 per cent (12 000 ppm), with the majority of the wells being less than 0.04 per cent (400 ppm). Each well was not tested individually to derive H_2S concentrations. These H_2S values are taken from historic gas analyses, which may exaggerate the values due to the vintage of the gas

analyses. The investigation team has concluded that the most representative H_2S concentrations are 0.89, 0.90, and 0.56 per cent for the Blairmore, Nisku, and Leduc Formations respectively.

The licensees reported that no wellheads are leaking and that they have been secured properly by chaining or removing the wellhead valve handles. The maintenance and inspection schedule for these wells is satisfactory. Wellbore fluid such as corrosion inhibitor is not required for low risk wells; however, 65 per cent (35) of the suspended wells have inhibited fluid in the casing/tubing annulus, which is an additional barrier to limiting internal corrosion.

The audit results indicated that 51 of the 54 wells assessed were in compliance with *Directive 013*. The other 3 wells had only a minor deficiency (signage at the well site). A minor item is defined as a contravention of regulation(s) and/or requirement(s) that does not result in a direct threat to the public and/or the environment and does not adversely affect oil and gas operations.

EUB Field Inspection Results

Of the 54 wells the St. Albert Field Centre inspected, 21 had minor noncompliance items (including those mentioned above). Most of these related to improper surface casing vent assemblies, well site signage, and well site housekeeping.

The field inspection also identified five wells with surface casing vent flows that had not been reported by two licensees in their audit submissions. It appeared that both licensees may not be testing for vent flows or meeting the requirements for reporting them as set out in *ID 2003-01: Surface Casing Vent Flow/Gas Migration Testing Reporting and Repair Requirements.* All surface casing vent flows must be reported to the EUB. If a well is found to have a vent flow, the licensee must classify the flow as either serious or nonserious, according to *ID 2003-01. Serious vent flows are to be repaired immediately.*

Nonserious vent flows have extremely low pressures and/or flow rates, cannot contain any sour gas, must not compromise groundwater, must not produce fluids, and must be monitored yearly to determine if their flow rates are increasing. Nonserious flows must be repaired when the well is abandoned.

Due to the discrepancies noted between the licensees' audit submissions and the St. Albert Field Centre's inspection results, St. Albert has required the licensees to inspect all shut-in, producing, and injection wells in the Acheson and Acheson East Fields and to report their findings by September 12, 2005. The St. Albert Field Centre will perform additional field inspections to validate the results submitted.

Casing Corrosion

The EUB ensures casing integrity in wells through its *Guide 10: Guide to Minimum Casing Design Requirements*, which states:

> The Oil and Gas Conservation Regulations require the licensee to maintain casing integrity for the life of the well. The Board recommends that corrosion of well casing be controlled to prevent casing failures and refers to NACE Standard RP-01-86, Recommended Practice for the Application of Cathodic Protection for Well Casings.

Casing integrity on all wells will be confirmed at the time of abandonment with pressure testing. Should a casing failure be identified during annual testing or during a routine

workover, the licensee is required to complete remedial repairs to restore casing integrity and report the failure and the remedial program to the EUB.

EUB staff reviewed all available casing inspection logs for Acheson and Acheson East Field wells, which amounted to 18 wells. EUB records indicate that there have been 20 casing failures for the total of 591 wells drilled. A review of casing failure data indicates that the most common cause of failures was external corrosion. There was no common failure depth and no reported fluid volumes discharging from the wellbores. All of the failures were repaired by approved methods.

Analysis of a casing inspection log is completed by dividing the casing into its individual joints showing likely or potential wall loss for each joint of casing. There are many factors that influence a casing's susceptibility to corrosion, including age, casing manufacturer, casing seam type, casing connections, external formation conditions, cement quality and presence, cement type, internal casing conditions, temperature, produced fluid types, and flow conditions.

Views of the Investigation Team

The results of the suspension audit and inspections of all suspended wells in the Acheson and Acheson East Fields indicated a high level of compliance with *Directive 013*. The investigation team sees this as very positive, given that licensees have until December 31, 2006, to comply with the requirements for low risk wells in accordance with *Directive 013*. While the investigation team is pleased that only minor noncompliance items exist and that they will be corrected soon, it is disappointed that numerous deficiencies, albeit minor, were not reported. It is particularly concerned that several surface casing vent flows exist and that they have gone untested and unreported. The investigation team agrees with the St. Albert Field Centre's approach of requiring the licensees to conduct further inspections and for it to validate the results received.

Further to this, the investigation team believes the EUB should continue its current practice of conducting audits of suspended wells and may use EUB field staff to validate licensee submissions.

The logs for the 18 wells appear to have corrosion rates consistent with wells of this age. Although the casing corrosion on the wells reviewed does not appear to be excessive for wells of this age, there were instances of isolated high corrosion sections in some wells. The investigation team believes that a more in-depth assessment of casing integrity in the Acheson and Acheson East Fields is warranted at this time.

Recommendations to the Board

The investigation team recommends that

1) The EUB require licensees of wells in the Acheson and Acheson East Fields to advise the Board by November 1, 2005, as to how they will meet the requirements of *Guide 10* for the remaining life of their wells. The licensees' audit results will assist the EUB in its evaluation of existing casing integrity requirements with regard to corrosion and wellbore security.

2) Since *Directive 13: Suspension Requirements for Wells* has been in place only as of December 1, 2004, and was implemented after a thorough review of *Interim Directive (ID) 90-4*, the EUB review the effectiveness of *Directive 13* after a further period of experience of one year.

Appendix 15 Acclaim Recommendation Submission

Acclaim supplied the investigation team with a number of recommendations in its incident report and sorted these recommendations into the following categories:

Major: materially relates to health, safety, or the environment

Medium: materially relates to the effective planning or implementation of an ERP, the conducting of well operations, or the effective investigation of the incident

Minor: relates primarily to the investigation of the incident or the administrative or financial aspects of implementation of an ERP or the conduct of well operations

The investigation team reviewed each of the recommendations and concluded that it supported all of the Major items. However, there were four Medium and Minor items where this support could not be offered.

Listed below are Acclaim's discussion and Major recommendations, as well as the Medium and Minor recommendations that the investigation team could not support. Those are followed by comments reflecting the team's position on those medium and minor recommendations.

Acclaim's Major Recommendations

1. Emergency Response Planning

Discussion
Protocols related to the coordination of the evacuation of area residents were unclear, resulting in uncertainty regarding the area for evacuation, and who was conducting the evacuation. The evacuation of residents immediately following the 2-26 blow-out lacked coordination, with 911 dispatch, the RCMP and the Enoch Band Police all involved in components of the evacuation. As a result, it was difficult for Acclaim to track residents who were evacuated. In addition, uncertainty existed at the start on the part of all responders as to the necessary evacuation radius, and it appears that many more people were evacuated than were necessary under any interpretation of the ERP. It has proved to be difficult to ascertain who determined the scope of the initial evacuation, and from whom the police took evacuation instructions. Acclaim only notified residents near the site, and then only to advise them of the incident and to stand-by in case evacuation was necessary.
Recommendation
Major Recommendation: Acclaim will be modifying its ERP's to provide clearly defined evacuation protocols and responsibilities for incidents, including protocols for keeping records and ensuring consistent evacuation communications to emergency response agencies and affected members of the public.
Recommendation
Major Recommendation: Acclaim recommends that the Board examine whether any changes to its general guidelines on evacuation communications are required.

Discussion
The calculation of a well specific Emergency Planning Zone (EPZ) did not occur prior to the commencement of operations on the 2-26 well. Prior to conducting operations at 2-26, a site specific calculation was not completed to confirm with certainty that a site specific ERP was not required. The calculation of this EPZ would have clearly defined the evacuation radius necessary in the event of an uncontrolled release at the well.
Recommendation
Major Recommendation: As part of the program for any well containing H_2S, Acclaim's operating procedures will be modified to include a review of the EPZ.

Recommendation
Major Recommendation: This EPZ will be clearly communicated to the wellsite supervisor, so that the wellsite supervisor is aware of the required evacuation radius in the event of an incident at the wellsite.

Discussion
The one window approach defined in the EUB's Emergency Preparedness and Response Requirements (Guide 71) did not work. Under Section 3.1.2.1 of Guide 71 an ERP must clearly define the responsibility to contact the EUB and other responders in the event of an emergency. The level of emergency is determined by the licensee and confirmed through consultation with the EUB. For level-1 emergencies, the licensee has the responsibility of contacting local authorities. At level-2 and level-3 emergencies the EUB contacts Emergency Management Alberta which implements fan-out calls to required governmental departments and agencies. In this way, the EUB acts as the "one window" through which the licensee communicates in level-2 and level-3 situations, and Acclaim's Corporate ERP reflects this protocol (Page 2-4). For the 02-26 incident, Acclaim considered itself to be at level-3 from the outset. This was communicated to the Board. However, the Board appeared reluctant to move to level-3 immediately. As a result there was confusion as to communication responsibilities. Acclaim made some calls to local authorities consistent with a level-1 response (prior to the initiation of the Government Emergency Operations Centre) but did not do a comprehensive fan out as Acclaim considered this to be the Board's responsibility under a level-3 situation. This two-pronged communication caused confusion and uncertainty on the part of stakeholders as to who was responsible for disseminating information. The problems caused by the circumstances are evidenced by public complaints from the Capital Health Region that it was not contacted (although Acclaim had contacted them).
Recommendation
Major Recommendation: Acclaim will be modifying s. 2 of its Corporate Emergency Response Plan to clearly indicate that Acclaim and the EUB must be at the same emergency level at all times.
Recommendation
Major Recommendation: The EUB review its Emergency Response Plan and clearly communicate the expectations for stakeholder notification to internal and external agencies.
Recommendation
Major Recommendation: Acclaim will develop a check list for it's Corporate Emergency Response Plan to ensure coordination of notifications between Acclaim and the EUB.

2. Downhole Operations Prior to the Incident

Discussion
The ingestion of air into the 2-26 wellbore during servicing operations was the major contributing factor to the cause of this incident. As noted in Section 6.0 of the Incident Report (filed April 15, 2005) Acclaim has reviewed the Root Cause Analysis in the context of the 02-26 incident, and future operations and asset integrity in the Acheson Leduc D3a Unit. The key conclusions are: • The root cause of the incident was a down-hole explosion which caused a failure of the intermediate casing. • The explosive mixture was natural gas (and possibly other trace gases) in the presence of air. • The only possible ignition source identified was unstable oxidized hydrocarbon products. • The primary fracture initiation site was at a point of significant corrosion of the intermediate casing. However, the corrosion was not the root cause of the failure. • It is not possible to determine the exact pressure created by the down-hole explosion, and it is, therefore, not possible to determine if the explosion would have resulted in an intermediate casing failure absent the corrosion at the fracture initiation site. The failure mechanism of the surface casing could not be definitively determined. However, the potential failure mechanisms for the surface casing all result from the initial failure of the intermediate casing and not from some independent root cause.

As the root cause of the incident was an underground explosion, the fundamental issue to be addressed is the prevention of underground explosions. An explosion requires fuel, air and an ignition source. As elimination of combustible substances in the wellbore is impossible, and elimination of all possible ignition sources during servicing would likely be impossible, Acclaim believes it is necessary to minimize the presence and duration of air in the casing in Acheson Leduc D3a wells and minimize the mixing potential of air and hydrocarbons from the reservoir at times when an ignition source could be present.

Recommendation

Major Recommendation:
Acclaim has developed a revised standard operating practice for the prevention of underground explosions that will be instituted on well servicing and workover operations on all Acheson Leduc D3a wells. This operating practice is intended to minimize the possibility and duration of air being trapped in the wellbore. In general, this procedure consists of placing an isolation packer in the hole at the end of daily operations, and pumping fresh water in the hole at a minimum rate of 0.20 m3/min during well service operations (As described in greater detail in Acclaim's April 15, 2005 filing.).

3. Communications

Discussion

The initial evacuation of area residents was uncoordinated, and the initial communication to residents was inconsistent across the involved agencies. As noted in s. 1.2 above during the initial evacuation of residents there was evacuation communication occurring to area residents by the RCMP, and the Enoch First Nation police, and subsequent public communication by Acclaim (to both area residents and the general public) and the EUB. This initial evacuation resulted in an evacuation area that was larger than necessary and may have heightened the level of anxiety in the public environment.

Recommendation

Major Recommendation:
Acclaim will be modifying its ERP's to provide clearly defined evacuation protocols and responsibilities for incidents, including protocols for keeping records and ensuring consistent evacuation communications to emergency response agencies and affected members of the public.

Recommendation

Major Recommendation:
Acclaim recommends that the Board examine whether any changes to its general guidelines on evacuation communications are required.

4. Decision Protocols

Discussion

The specific evacuation radius for the 2-26 well operation was not known by the Acclaim wellsite supervisor.

Recommendation

Major Recommendation:
As part of the program for any well containing H_2S, Acclaim's operating procedures will be modified to include a review of the EPZ.

Recommendation

Major Recommendation:
This EPZ will be clearly communicated to the wellsite supervisor, so that the wellsite supervisor is aware of the required evacuation radius in the event of an incident at the wellsite.

Discussion

It is unclear who made the decision to initially evacuate the number of residents in the area that were evacuated, and on what basis. As noted in s. 1.2 of these conclusions and recommendations there was uncertainty regarding the area of initial evacuation and it remains unclear as of the date of this submission who directed the scope of the initial evacuation.

Recommendation

Major Recommendation:
Acclaim will be modifying its ERP's to provide clearly defined evacuation protocols and responsibilities for incidents, including protocols for keeping records and ensuring consistent evacuation communications to emergency response agencies and affected members of the public.

Recommendation

Major Recommendation:
Acclaim recommends that the Board examine whether any changes to its general guidelines on evacuation communications are required.

Acclaim's Medium and Minor Recommendations

1. Emergency Response Planning

Discussion
Acclaim's Corporate Emergency Response Plan worked well in guiding Acclaim's response to the Acheson 2-26 incident. Acclaim utilized its Corporate Emergency Response plan for this incident, with the Acheson Area Emergency Response Plan as a resource document. The Acheson ERP was not approved by the EUB at the time of the incident. It had been submitted for approval November 12, 2004. The Corporate ERP contained the necessary information, guidance and instructions necessary to effectively handle this incident.
Recommendation
Minor Recommendation: Except as detailed below, Acclaim is not planning any changes to its Corporate ERP. The Acheson Area ERP was approved March 31, 2005.
Investigation Team Assessment
The investigation team does not support this recommendation, as a review of Acclaim's corporate ERP indicated that some changes are necessary in order for it to meet *Directive 71* requirements.

3. Communications

Discussion
Communication from Acclaim to the EUB occurred through many channels, resulting in a lack of clarity and inconsistent messages. It was not clear to Acclaim who the EUB decision makers were. Throughout this incident, Acclaim was communicating with Calgary EUB staff, on site EUB staff and EUB and other stakeholder staff at the REOC. Communicating with the EUB in this manner, resulted in confusion and uncertainty regarding who the EUB decision makers were. The Acclaim personnel communicating to each of the three EUB windows were different in each case. This resulted in instances when the communication of information was different to each, creating confusion and incremental work to clarify the uncertainty.
Recommendation
Medium Recommendation: When dealing with level-2 and level-3 situations the Board consider the implementation of twice daily telephone conferences between the licensee's head office and field decision makers, and the Board staff dealing with the matter at the Calgary office, on-site and at the REOC.
Investigation Team Assessment
The investigation team supports the need for good communication between the licensee and EUB staff who are making decisions about an incident. Since the investigation has recommended that the EUB review its decision-making protocols, it believes it is premature for the EUB to commit to the twice daily telephone conferences at this time. The investigation team does not support this recommendation for this reason.

Discussion
Communication from Acclaim, the EUB and other stakeholders was not always consistent and lacked coordination. This may have contributed to a heightened level of public anxiety. A good example is the public communication by Capital Health. Rather than working in partnership with Acclaim and the EUB to deliver a consistent public message, the approach by Capital Health resulted in significant work on the part of Acclaim and the EUB to respond to their allegations. Acclaim and the EUB (through the REOC), did work to coordinate and review each other's press releases, however this was at times haphazard and rushed due to pressures from the public for immediate information. Acclaim recommends that in the future, public releases from either the licensee or the EUB be reviewed by each other for consistency before release. In addition, Acclaim recommends that as part of the EUB's one window emergency response plan, that the EUB release public information on behalf of all stakeholders.
Recommendation
Minor Recommendation: Acclaim's protocols will establish that in an future incidents all efforts will be made to ensure that public releases from either Acclaim or the EUB be reviewed by each other for consistency before release.

Investigation Team Assessment
Although it is important for accurate and current information to be issued in news releases of both the licensee and the EUB, the investigation team believes it is inappropriate for a licensee to review EUB news releases before they are issued. It is the EUB that must decide on the appropriate content of its news releases; however, the EUB may have the need from time to time to obtain confirmation from the industry of the facts, subject to any securities, proprietary information, or other considerations. In addition, the investigation team believes the EUB should review all licensee news releases after they are released to ensure that they contain all required and/or relevant information. If appropriate information is not included in licensee releases, the EUB can issue its own news release, thereby ensuring that the public receives all relevant data. The investigation team does not support this recommendation for these reasons.
Recommendation
Minor Recommendation: As noted in s. 1.6 above Acclaim recommends that the EUB review whether, as part of the EUB's one window emergency response plan, that the EUB release public information on behalf of all stakeholders.
Investigation Team Assessment
The investigation team supports the one-window communication concept for many aspects of emergency response; however, it believes other emergency responders (e.g., public health agencies) would rather issue their own news releases in most cases. The investigation team does not support this recommendation for this reason.